Foundation and Development Coaching Manual

Outline and Lesson Plans

Version	Updated by	Modifications	Date
8	Andrew Russell	Re-Issued for Accreditation Courses	21/10/2013
9	Andrew Russell	Re-Issued for Accreditation Courses	7/11/2013
10	Andrew Russell	Re-Issued for Accreditation Courses	4/05/2014

CONTENTS

FOUNDATION AND DEVELOPMENT COACH MANUAL 4
1 Foundation and Development Coach Descriptions 5
2 Introduction 6
3 The Safety/Orientation Class 7
4 Archery Safety 14
5 The Steps of Shooting 17
6 Shooting Practice 18
7 Teaching a New Archer 19
8 Teaching a New Archer – Practical Example 21
9 Problem Correction 22
10 Problem Correction Activity 27
11 Equipment 28
12 Archery Programme Development 35
13 Example Group Instruction 37
14 Have-A-Go Sessions 38
15 Knowledge of Governing Bodies and Competitions 39
DEVELOPMENT COACH MANUAL – ADDITIONAL MATERIAL 40
16 Equipment and Selection 41
17 Recurve Bow Set-Up 46
18 Compound Equipment 52
19 Equipment Maintenance 57
20 Mental Training 58
21 Technique 60
22 Problem Correction – Practical 68
23 Physical Preparation 69
24 Drug-Free Sport 73
25 Appendices 74

Course Programme

Section	Recommended Time Allowance
FOUNDATION AND DEVELOPMENT COACH	
Introduction and Course Outline	15 minutes
Example Safety/Orientation Class	1 hour
Archery Safety	30 minutes
The Steps of Shooting	30 minutes
Shooting Practice	45 minutes
Teaching a New Archer	1 hour
Problem Correction	45 minutes
Equipment	45 minutes
Archery Programme Development	15 minutes
Example Group Instruction	45 minutes
Have-A-Go	15 minutes
Knowledge of Governing Bodies & Competitions	15 minutes
Foundation Coach Examination (Closed Book)	30 minutes
DEVELOPMENT COACH	
Equipment Selection	15 minutes
Recurve Bow Set-Up	1 hour
Compound Equipment	1 hour
Equipment Maintenance	15 minutes
Mental Training	30 minutes
Technique	2 hours
Problem Correction - Practical	1 hour
Physical Preparation	15 minutes
Drug-Free Sport	15 minutes
Development Coach Examination (Closed Book)	90 minutes

Note: These durations are indicative only.

FOUNDATION AND DEVELOPMENT COACH MANUAL

1 Foundation and Development Coach Descriptions

This manual provides the course information for both the Archery New Zealand (ANZ) Foundation Coach and Development Coach courses. Foundation Coaches will undertake the first part of the course content, with Development Coaches undertaking the entire manual content.

1.1 Foundation Coach

The Foundation Coach Course is offered for those who wish to work with grass-roots archery – school camps, have-a-go sessions and other archery in schools. Anyone aged 16 years or older can undertake the course; applicants do not need to be a member of Archery New Zealand. This course is also suitable for Archery New Zealand members with less than two years' archery experience who wish to get involved with club coaching and assist with running have-a-go days and beginner courses.

1.2 Development Coach

The Development Coach Course is offered for those who wish to act as a club coach. Candidates must be over 18, a member of ANZ, and have been involved in archery for at least two years. The course will enable candidates to lead club beginner courses, as well as work with club members to support their development and growth from their first lesson to major tournament level.

To remain recognised as an ANZ Development Coach, coaches must remain members of ANZ in good standing.

1.3 Other Archery New Zealand Courses

In line with an athlete-based coach approach, ANZ offers a Performance Coach Course for those intending to work with Performance archers, and take archers from shooting regional tournaments onto New Zealand Representation.

The High Performance Coach Course is offered for those who will be working with the country's high performance archers, and will target taking these archers from international representation to successful performance on the world stage.

1.4 Liability

Archery New Zealand (ANZ) takes on no liability whatsoever for coaches who undertake these qualifications. It is the responsibility of coaches to arrange their own professional indemnity insurance.

1.5 Reaccreditation

In order to maintain currency of qualifications and to show that they are 'active' coaches, there is a self-assessment that Development Coaches and above submit every 3 years. Foundation Coaches can re-sit the Foundation Coach examination, and must pass to retain accreditation as an ANZ Foundation Coach. Refer to the ANZ National Coaching Program document on the ANZ website.

1.6 Coach Development

The ANZ Coaching Commission organises coach development seminars in each of the districts every year. Coaches should seek out these opportunities to keep up to date and improve their skills.

2 Introduction

2.1 Purpose of this Manual

The purpose of this manual is to act as a teaching resource and lesson plan for the instructors of Foundation and Development Coach Courses, but also for the candidates to use in their studies. The manual contains the information that will be examined at the conclusions of the course. The manual is also available to be used by coaches as a reference guide, and it is encouraged that coaches consult it where necessary.

2.2 Introduction of staff and participants

The class instructor shall introduce themselves and explain their archery background and experience in coaching.

Candidates shall introduce themselves and explain their archery background.

2.3 Explain course outline and requirements

A brief explanation of the course will be given, and schedule for the day outlined. This is a good time to discuss the schedule and to discover any problems that may come up. Schedule changes should be made only if the entire class is in agreement. The organiser should share any information about the meal times, places, and the location of the rest rooms.

Participants are encouraged to ask questions and participate in discussions. Everyone has something to contribute. Questions may be asked at any time.

2.4 Course Requirements

There are three requirements that candidates need to fulfil in order to pass the course and become certified:

- Candidates must attend all sessions of the course.
- Candidates must pass the written test with a score of 75% or better.
- Candidates must pass the practical test, teaching a "Safety Orientation" class to a group. This third requirement is necessary so that candidates can be seen to know all of the range rules and procedures, can explain and demonstrate a shot, and can control a group. In this section, candidates shall go through each step of shooting, discuss common beginner errors, and how to correct them.

2.5 Coach Code of Ethics

All coaches and coach candidates must adhere to the SportNZ Coach Code of Ethics. Breaches of the code of ethics should be referred to the ANZ Coaching Panel.

3 The Safety/Orientation Class

In this section, the course instructor will run an example Safety/Orientation Class, with the coach candidates acting as the beginners. The notes in this section can be used by the course instructor to ensure key points are covered, and can also be used by coaches as a guide to running a beginner's course session.

3.1 The Safety/Orientation Class - Demonstration

The entire class of coach candidates will be taken through a Safety/Orientation class as if they are first time shooters. Candidates may have to take turns shooting if there are not enough bows. This part will be kept brief with candidates shooting as soon as they can. The coaching instructor will help them individually with their form.

The shooting line will be at 5 metres, unless there is a risk of arrows rebounding further than this off hard objects.

The following sections consist of instructions for the Course Instructor to follow:

3.1.1 Safety/Orientation Class Key Points.

There should be a minimum of three different safety talks throughout the first class of tuition:

PART 1 - Handing out equipment;

PART 2 - Before they shoot, and;

PART 3 - Before they pull their arrows for the first time.

The course instructor needs to set the example during the safety/orientation class. Practice teaching this class until it can be done near perfectly. Here are a few key points to remember:

- The most important part of the safety/orientation class is 'Early Participation, Early Success'. The archers come to the archery range to shoot. Get them shooting as quickly as possible. The early success is accomplished by making sure that they are **close enough to the target to hit it every time.**
- Start the archers out close to the target (5 metres preferred, unless there is risk of arrows rebounding further off hard objects). Arrows should always hit the target or target butt. Missed arrows are not necessary. The archers will be more successful and will have more fun if you start them close to the target. If they miss the butt shooting time is wasted retrieving arrows. Missed arrows also become lost or damaged. Students searching for lost arrows also add an additional element of danger. As the students' progress, then can be rewarded by moving to further distances.
- As soon as the equipment is handed out, get the archers on the shooting line.
- This will get their attention focused on you. Since they are all facing in the same direction, they will quit talking to each other.
- Keep it brief and simple. Save anything that the students don't need to know to shoot their first arrow for a later time. (This includes the parts of the bow and arrow, the history of archery and equipment tuning.)

- Only instruct students on a rule or procedure at the time they need to know it. If a group of students sit down and listen to a list of rules, they will accomplish very little. They will not remember most of the rules, and many will not even make sense until they have begun the activity. Example: When you hand out the arrows. Instruct them to keep them in their quivers. Explain how to pull arrows only after they have shot, and right before they are going to pull them.
- Keep all of your words and sentences positive. Don't say 'Don't'. Never say 'Never'. They will learn the importance of this by your example.
- Make sure that you cover all of the Archery Range Rules and Procedures. You will have to repeat some rules several times to remind the archers. Example: "Keep your arrows in your quiver until I have blown the whistle to begin shooting.
- Speak clearly and take control of the group. Be confident.
- Always enforce every rule 100%. Example: “Make sure every arrow is in a quiver and everyone is straddling the shooting line before blowing the whistle one time to begin shooting.”
- Make sure that everyone can hear you and all are paying attention. Stand where everyone can see the front of you during the shooting demonstration.
- Always keep your arrow pointed down or towards the target while demonstrating.
- Keep the class moving. Always keep the archers busy with positive instructions. If individuals are having problems, finish the class and then work with them individually.

3.2 Safety/Orientation Class Lesson Plan

3.2.1 Range Rules and Procedures

Explain the archery range safety rules and procedures. Make sure that you have memorised these and cover each one.

Explain the whistle system and the responsibility of the range captain.

When I blow the whistle two times, you may walk from the waiting line to the shooting line.

Keep your arrows in the quivers until the whistle is blown one more time to begin shooting.

After you have shot all of your arrows, step back off the line and put your bow on the bow rack.

Wait behind the waiting line until the whistle is blown 3 times to go forward and retrieve the arrows.

If the whistle is blown 4 or more times (demonstrate), then immediately stop shooting and put the arrows back in the quiver. This means that there is an emergency on the range, such as a person or an animal walking behind the targets. If at full draw, use the phrase “Come Down” to get archers to draw the bow down to rest without releasing an arrow.

If you drop an arrow, wait until the whistle is blown 3 times before you pick it up (This is for additional safety).

Always keep your arrows pointed down or towards the target. Shoot only at your target.

For a novice course, it is recommended that a ratio of 1 coach to 3 or 4 archers is used.

3.2.2 Eye Dominance Test

Before the archers begin shooting, quickly determine their eye dominance. This is only necessary for programs where the students are going to shoot for more than a few days.

Just as people are right or left handed, one eye is sometimes more dominant than the other. Discovering which eye an archer favours is important because it determines whether they will shoot left or right handed; if an archer is right eye dominant, they will shoot right-handed with the bow in their left hand and the string in their right hand. This will be the opposite for a left-handed archer.

If there is no strong eye dominance, the handedness should be determined by a student's writing hand. (i.e. a right-handed person would shoot a right-handed bow).

It is a preference for both eyes to be open, as this keeps the archer visually relaxed. If for any reason an archer needs to obscure an eye (i.e. a dominant right eye, but shooting left-handed due to an injury), this can be done by using an eye patch or glasses with a whited-out lens.

Have the class extend their arms out in front of them and form a small hole by crossing the fingers of one hand over the other fingers of the other hand, and touching their thumbs together, with both eyes open – see Figure 1 below. Look at an object in the distance, such as a target face. Move your hands up, and look at the object through the hole that you formed with your hands. Instruct them to pull their hands back to their face while keeping the object in the hole. Whichever eye they bring their hands to is their dominant eye. This can be done a few times to ensure accuracy.

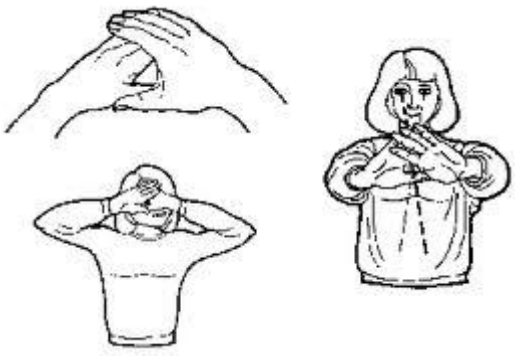


Figure 1: Checking Eye Dominance

Note that for have-a-go sessions, it is usually preferable for speed to have the beginners start out using handedness (i.e. if they write with their right hand, they use a right-handed bow). If beginners have issues using their correct eye, the coach may see fit to trial a bow of the other handedness.

3.2.3 Hand out Equipment

Hand out arm guards and finger tabs to class participants. Show them how to put the arm guard on, and explain that it is used to protect the forearm from the bowstring.

Show them how to put on their finger tab, check the correct size, and explain that it is used to protect their fingers and to provide for a smoother, faster release. They should always wear these items while shooting.

Check to see that everyone is wearing snug-fitting clothes. Have them tie back long hair, remove large ear rings and clear off any pins and remove everything from chest pockets. These items may get caught on the string.

Explain to the archers that you are going to measure them for their correct arrow length. Before you hand out any arrows, tell them to keep their arrows in their quiver until they are told to shoot. They should clip the quiver on to their pants, a belt loop, or their back pocket, on the right side towards their rear. Explain that if they are shooting left handed, they need to put their quiver on the opposite side.

Measure each archer for their correct arrow length by having them hold their arms stretched out in front of them with their palms together. Place an arrow with the nock touching their breast bone just below the chin. The arrow should extend at least two inches past the tip of the fingers. Note that as an alternative, you may get the student to hold their arms out to their sides, and point their head towards the hand they will hold the bow with. With the nock at the tip of the chin, the arrow should as a minimum reach to the tips of the student's outstretched fingers.

Give each archer the same number of arrows. Tell them to only use the arrows that are given to them, and to remember what they look like.

If you are using ground quivers, have them hold the arrows by the points and put them in their ground quiver as soon as they get them.

Tell the students that you are going to hand out the bows now. They need to let you know if they are shooting left handed. Explain to them that they should hold the bow by the grip.

Warn them that pulling back on the string and letting go without an arrow in the bow is dangerous and may cause the limbs to break.

Show them how to set the bow down on their toe instead of on the ground. This will protect the limb tips.

Tell the archers to let you know if anything doesn't look or sound right with their equipment (identify arrow damage etc.)

After all of the equipment is handed out, have the archers go to the waiting line.

3.2.4 Demonstrate a Shot

Explain that you are going to show them the steps of shooting, and that you want them to keep their arrows in their quiver until you tell them that they are ready to shoot. If you fail to do this, they will follow your instructions and shoot you!

Go through the steps of shooting, keeping it very simple explaining only what they need to know to get their first arrow shot.

It is recommended that elastic bands are used to initially demonstrate the technique, and also given to the students to use to get the technique correct before putting a bow in their hands.

3.2.5 Steps of Shooting Dialogue

Explain and demonstrate the procedure for shooting an arrow from start to finish. Keep it very brief and simple.

The first step is the stance. Put one foot on each side of the line with your toes facing that way (point towards the side of the range). If you are left handed, you want your toes to face that way (point in the other direction).

Next you place the arrow on top of the plastic arrow rest. Does everybody see their arrow rest? (Hold your bow up so they can see your finger pointing to the arrow rest, then set arrow on the rest.)

Then you snap the arrow on the string right in between the two tie-on nocking points. Does everybody see the nocking point on your string? Make sure that the odd coloured fletch is facing you or away from the bow.

Now you hold out your three fingers like this (show), like a Scout sign. Hook those three fingers on the string underneath the arrow and slide your fingers up until your top finger touches the arrow. The pressure of the string should be felt in the first groove of each finger.

This is called the archer's groove.

If students will be shooting regularly, rather than as a once-off experience, it is recommended that the Mediterranean grip be used – index finger above the arrow, and middle and ring finger below the arrow. The arrow will stay on the string without needing to hold it there. Leave a small gap between your fingers and the arrow so as not to pinch the arrow.

Now, before drawing back, push the bow straight to the target, and keep your drawing arm elbow up near the level of your shoulder.

Draw the string straight to the front of your chin and nose, using your back like you would to start a lawnmower. Point the arrow at the target, and relax your fingers to release while you continue to pull.

Continue to hold your follow through until the arrow hits the target.

Note that for club beginner courses, a finger or wrist sling is recommended. This will enable archers to relax their front hand during the shot, so as not to twist the bow and affect the flight of the arrow.

3.2.6 Watch Their First Shot

Now explain that you would like to watch them shoot their first arrow to make sure that they are not going to hurt themselves or anyone standing near them.

When you blow the whistle once, they can take their arrows out of the quiver and nock them on the string. Tell each of them to wait for you to watch them personally before they shoot their first arrow.

Go behind the shooting line and blow the whistle one time. During the first few ends give verbal commands along with the whistle commands. This will help the participants get used to what the whistle commands mean.

Watch each student shoot, making sure that they are not going to hit their arm, shoulder, or chest. Let them get used to shooting, just pulling back the string to their face and releasing the arrow.

3.2.7 Before Pulling Arrows

Make sure that all of the archers are behind the waiting line before blowing the whistle 3 times.

Tell them to WALK to the target after the whistle is blown 3 times, and to wait behind the target line.

With the archers at the target line, demonstrate how to pull an arrow. Explain that this can be the most dangerous part of the sport. They need to make sure that no one is standing behind them. Two archers from each target butt may move forward to the side of the target. Standing to the side of the target, place one hand on the target face next to the arrow, grip the arrow as close to the target as possible (touching the hand on the target face) and pull the arrow straight out – note that students MUST check that nobody is immediately behind the arrows when drawing from the target. If you grip the arrow near the nock end, you will bend or break the arrow.

Place the arrow in the quiver or other hand before pulling out the next arrow.

Demonstrate how to pull an arrow from the ground by pulling it back the way it went in, trying to pick it up will bend the arrow.

After they have retrieved all of their arrows, ask them to return to the waiting line and wait for two whistles. Two whistles Indicates that they may pick up their bows and move to the shooting line. Remind them to keep their arrows in their quivers until they hear one whistle.

3.2.8 Work with Individuals

Work with individuals to get their body in alignment, or "T" form. This will make shooting easier for them.

After they have shot several ends, and are comfortable with shooting, you may begin to add a few instructions.

You may like to tell them that this is the secret of archery. If they can do these two things exactly the same every time, their arrows will go in the same place every time.

The first thing is pointing the arrow in the same place every time. This is done by controlling the position of the string hand with a reference point. Explain the importance of a reference, and show where the arrow will go: If the reference is too high, or too low. Tell them to reference with the third joint of their first finger underneath their jawline and string on the tip of their nose. When drawing the bow, keep the drawing forearm and wrist relaxed, as if there is a rope connecting their elbow to the string. The string hand should make contact with the front of the chin, and maintain contact sliding along the chin as the string is drawn back to touch the tip of the nose.

Next, explain techniques of a good release: string fingers to relax instantaneously with string elbow rotating around, string hand coming to rest near the back of the neck.

The best way to accomplish these steps is by using the "One Pull" method. Once they start drawing the bow (or pulling the string), they want to keep pulling as they reference, aim, release, and follow through. Tell them to keep pulling as they relax their string fingers.

3.3 Safety Talk Summary

The following is a useful list for coaches to ensure that all of the most important safety points are covered in a Safety/Orientation Course:

PART 1 – Before Handing out Equipment

- Weapons sport
- Only load bow on shooting line
- Arrows are sharp
- Dry firing
- Safety Gear

PART 2 – Before Shooting First End

- Range Layout (Shooting Line, Waiting Line)
- Whistle Commands
- What to do if arrow falls in front
- Sky-Drawing
- Explanation of “Come Down”
- Wait for coach to supervise personally before firing first arrow

PART 3 – Before Collecting Arrows

- Reiterate whistle commands
- Nocks are sharp too!
- Always walk
- Purpose of target line
- Pick up arrows before the target
- Check behind before pulling arrows

4 Archery Safety

In this section, the Course Instructor will discuss the basic requirements of safety on an archery range with the candidates.

4.1 Explain Importance of Safety Lecture

The key elements of the Safety/Orientation class are:

Early Participation

- Students come to the archery range to shoot. Get them interested in archery by letting them shoot. Have the equipment ready and get them shooting quickly.

Early Success

- Make sure that the group is close enough to hit the target every time.
- Teach them to shoot — Explain and demonstrate a shot. Keep it very simple.
- Explain and enforce the Rules and Procedures.

The Safety/Orientation class is the first class that coaches should give to any group of archers that you are going to teach. Even though many may have shot before, they may not have used the type of equipment that you are using, and they may have learned different rules and procedures. This class is a perfect introduction to the sport of archery for a group that you are only going to see one time, or as a first class for many sessions or an on-going program.

It is important that the coaches keep records of who has taken the safety/orientation class. This way you will know who has and has not been taught the archery range rules and procedures. You can keep a record of names, or hand out cards to the students that have taken the class.

The Instructor should discuss the key points of the Safety/Orientation Class from the previous section. Go over the Safety/Orientation Class Outline, pointing out key elements and rules.

Discuss additional elements that the candidates need to be aware of:

- The Coach should be the last one back from behind the targets.
- Keep the arrows in the quivers.
- Watch for archers over-drawing the bows.
- Make sure that the target area is clear, behind and In front of the targets before blowing the whistle.

4.2 Archery Range Set-up

Archery Range safety standards are important for liability reasons. See Figure 2 below for an example.

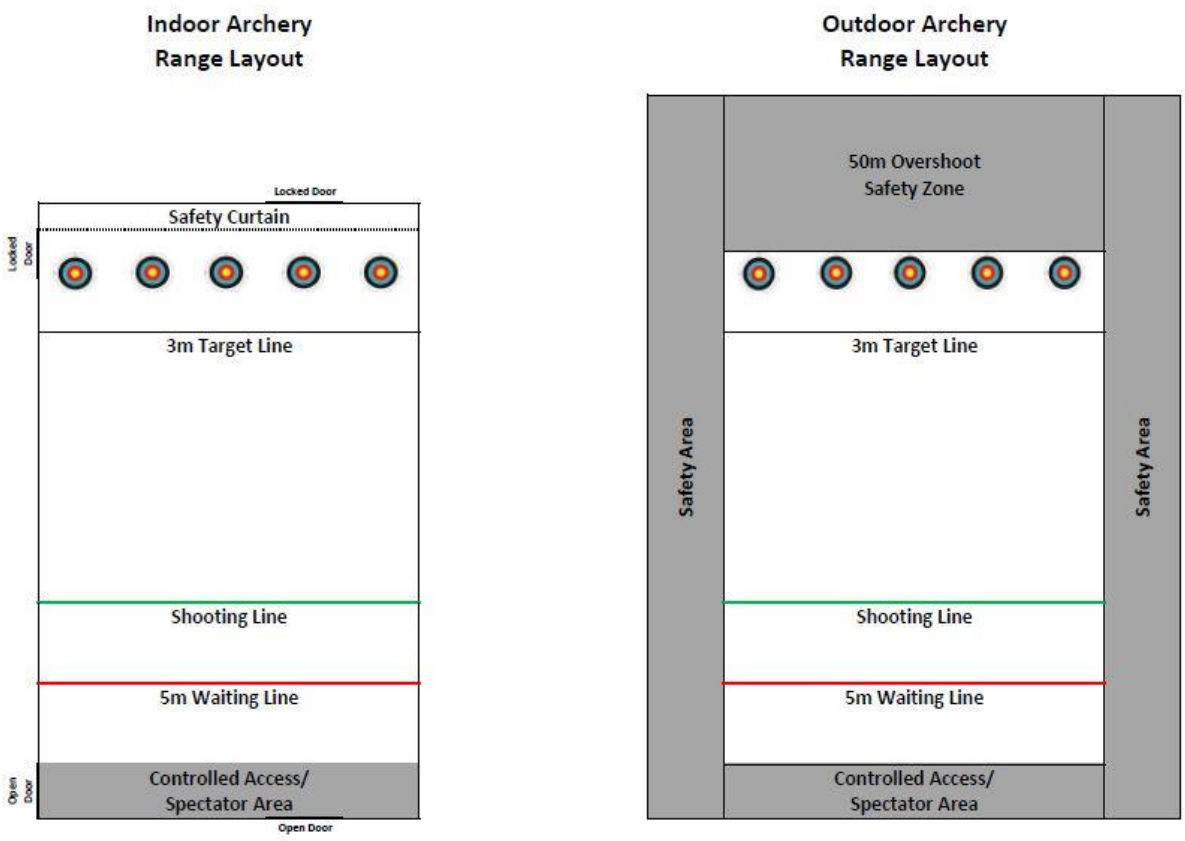


Figure 2: Indoor and Outdoor Range Layout

There should be a shooting line, a waiting line, and a target line. These can be made with rope or tape. Do not secure ends to prevent tripping. The shooting line should be at a distance that is close enough to hit the target every time. This will vary with the age and ability (or disability) of the archers, and the size of the target butts.

The preference is for a single shooting line (not staggered).

The waiting line should be 5 metres behind the shooting line. The waiting line allows the range director to have a clear view of the archers that are shooting and a clear line so that the whistle will not be blown while archers are still shooting.

The target line should be 3 metres in front of the targets. This line acts as a 'speed bump', slowing the students down so they won't run into the arrows sticking out of the target. It also keeps the students that are not pulling arrow out a safe distance behind the targets.

Ensure access to range is controlled and visible from all directions by the range captain. There should be an overshoot distance of minimum 50m to protect against ricochets and overshoots. Where possible, this should be extended. Note that a beginner's bow may travel in the order of 150m if shot at a high angle (maybe further depending on poundage, draw length etc.), hence sky-drawing must be prevented.

All places of archery should have a well-stocked first aid kit on site.

4.3 Safety Equipment

For most grass-roots courses, beginners should be issued with the following safety equipment:

Arm-Guard: Used to prevent the string hitting the forearm.

Finger Tab: Used to protect the fingers from wear from the string.

4.4 Child Protection Policy

Care should be taken to ensure that coaches are not put in a position where they are the only coach in charge of junior archers, without another adult being present. This could take the form of requiring a responsible parent or teacher to remain with a coaching group at all times.

Coaches shall adhere to the ANZ Child and Vulnerable Adult Protection Policy.

4.5 Conditions of Participation

Coaches must ensure that only people who are in a fit state to do so, practice archery, as it is a weapons sport. No one under the influence of alcohol or drugs may participate.

Participants should also be asked upon application to declare any mental or physical conditions that may impact on them being unable to understand and follow instructions given. The coach will need to use their discretion to determine whether or not someone is fit to participate, or not. In some cases, with certain conditions, it may be appropriate to undertake fully supervised one-on-one coaching.

5 The Steps of Shooting

Use the '9 Steps to the Ten Ring' Poster (in Appendix)

In this section, the instructor should explain to the candidates the steps of shooting; including how and why it is done that way.

The basic "T" form should be stressed, as this is easiest for beginners to understand.

The information on the '9-Steps' poster is all that candidates need to know.

During this section only proper shot execution will be discussed. Common problems and problem correction will come later.

A video of the '9 Steps to the Ten Ring', if available, may also be shown instead of this section.

6 Shooting Practice

In this section, the Course Instructor shall work individually with each archer to improve their form, using the '9 Steps'. The Instructor should remember to model proper coaching techniques while working with the candidates.

Have the candidates practice each step of shooting, as explained in the '9 Steps'. Read off one or two steps and their descriptions for them to concentrate on each end.

7 Teaching a New Archer

In this section, candidates learn how to teach a new archer.

Ensure that you "Keep It Simple" when working with new archers,

7.1 Teaching a new archer how to shoot their first arrows

One of the most important things to remember in providing instruction is that you always talk about and demonstrate the correct way to do things. You should never demonstrate improper techniques.

Young archers place great value in learning sport skills and they look to you, their coach, to help them learn. Therefore you should do all that you can to become the best teacher possible.

As a coach, your primary mission is to help each of your athletes become all that they can become not only in their sport but also in life.

Teaching archery in the beginning stages involves three major steps:

1. Verbally introduce the skill and simultaneously use mimetics;
2. Demonstrate and briefly explain the skill with equipment and;
3. Help your students to perform the skill well enough to effectively practice it.

During the safety/orientation class, the coach must watch each archer shoot their first arrow one-on-one – no student may shoot their first arrow without direct guidance from a coach. All of the archers have heard the procedures and watched the demonstration. Many have shot before. These you just watch shoot to make sure that they are doing everything right. There will, however, be some that just don't get it. They may try to stick the arrow through the sight ring, hold the bow backwards, or just stand there doing nothing. These are the ones that you will have to help quickly to get them to shoot that first arrow.

When working with a new archer, stand with one foot on each side of the line right In front of them or slightly behind the line. You need to have both hands free to give instructions and handle any problems that may come up.

7.1.1 Procedures

The first step is making sure that they understand the procedures. They can't shoot until they understand how to nock the arrow, grip the bow, and hook the string. Keep these simple, putting their hand on the grip and hooking their fingers around the string for them. Once they get the feel, they will be all-right. You may need to nock their first arrow for them. Nocking the arrow can be the most frustrating part of shooting for a new archer. Once they see the arrow nocked on their bow and shoot an arrow, they have a better understanding of how everything is supposed to happen.

7.1.2 Safety

Make sure that they are not going to hurt themselves. When they are at full draw, look at the path that the string will make towards the bow. If there is any body part (elbow, shoulder or chest) in the way, they are going to hit it! Coaches must catch this before it happens and stop students from shooting until they can take care of it. Firstly, try rotating the bow arm elbow and relaxing the

shoulder. If these don't work, you can open their stance or get a longer or second arm guard as a last resort.

Be aware also of the danger of catching the string on a nipple piercing upon release. Coaches may not know whether a student has piercings, so ensure that you prevent them over-drawing to eliminate the risk.

7.1.3 Body Alignment for Strength

The next thing that should be worked on is getting the archer in to a natural “T” position with correct alignment. This will enable them to shoot from a stronger position and make shooting easier.

7.2 The Moulding Technique

With the archer’s permission, use a hands-on approach to get their body in the proper "T" position. Mould their hand into a hook and wrap it around the string. Put their hand into the proper bow hand/grip position. Explaining and demonstrating is ineffective when teaching new archers the procedures of shooting. The best way is to put the bow in their hand, the string on their fingers and let them feel what it is supposed to feel like.

Never take a bow out of a beginner’s hand to 'show them how it's done'. They have already seen you demonstrate a shot during the safety orientation class.

Keep the bow in their hands, and create a statue of an archer.

Note that hand-on application requires permission of the archer. Be aware of the context to ensure it is appropriate, and use common sense.

7.3 Special Needs

Special needs archers will usually require one-on-one coaching assistance. Where possible, coaches should be aware of the special needs of participants before they arrive to shoot. This can be determined by use of a disclosure statement on course or club application forms. Be prepared to suggest a more suitable lesson format if safety may be compromised.

8 Teaching a New Archer – Practical Example

In this section, the candidates will get practical experience at teaching a ‘new’ archer.

The Instructor should divide the candidates into As and Bs by counting off. Have everyone put on their arm guards, finger tabs, and quivers. Have the 'A' archers pick up their bows and go to the shooting line. Ask the 'B' archers to select a student and stand behind them. If there are an odd number of students in the class, have the extra one practise running the range.

Explain to the archers that they are to act like a group of 10 year old campers that have never shot a bow before. They are to do all the things that a young person would do that have never shot before.

The 'B’ archers are to help the new 'A' archers shoot their first shots. Have the coaches go to the targets with the archers to explain how to pull the arrows out properly.

Stress the following points:

- Give positive instructions and lots of encouragement;
- Get the new archers shooting quickly;
- Make sure that they are not going to hurt themselves;
- Get them shooting in alignment.

For the second end, have the archers switch positions so that the student is now the coach, and the coach the student. This gives them a chance to get even. On the third end, ask the 'A' archers to take their place on the line. Have the "B' archers move over one person to the right. The person who falls off the end will go to the other end or replace the student acting as range captain so that they can join in the rotation.

9 Problem Correction

In this section, the candidates will learn about how to correct problems.

9.1 Problem Correction

Once coaches know how a shot is supposed to be executed and what an archer is supposed to look like, that is all a coach needs to teach. Whenever you see something that is not right, you just demonstrate to the archer how to do the skill correctly.

There are no technical terms or new terminology that you must learn to be able to teach. The students that you teach will not understand them if there were. Just speak plain, simple English. If it makes sense to you, it will probably make sense to them.

Explain the positive approach to coaching. Also stress the importance of lots of positive comments and encouragement when working with new archers. Always find something they are doing well, and do not criticise or point out faults.

9.2 Positive approach in teaching archery

Two common faults of novice coaches that are trying to help are:

- Only pointing out errors, telling the archer what they are doing wrong. Example: "You're gripping the bow."
- Telling them not to do whatever they are doing wrong. Example: "Don't grip the bow."

These two statements contain no information about what the coach wants the archer to do. A correct and positive coaching statement would be, "Keep your bow hand relaxed". Coaches that give positive instructions are more respected by athletes. Negative instructions lower an athlete's self-esteem and make them not want to listen to you.

Your mind cannot visualise not doing something. Try this: "Don't think about pink elephants." What are you thinking about? Now If I said "Think about green rabbits", would you be thinking about pink elephants?

We are teaching our most advanced archers to visualise and concentrate on what they want to make happen. We should start out by teaching our newest shooters to think this way. If you teach with negative statements, don't be surprised if your archer goes to a tournament thinking, "Don't choke, don't choke". What do you think will happen to this archer?

9.3 The "Oreo" Technique

First candidates must learn how to make a proper coaching statement. One approach can be to give the students an Oreo cookie. An Oreo Cookie has 3 parts: the cookie, the cream in the middle, and the other cookie. Here's how it works.

- The Cookie - Find something to compliment them on. This reinforces a correct behaviour and opens them up to your ideas to help them improve ("Your release looks really smooth.")
- The Cream - Give them a positive instruction on how to perform the skill correctly without telling them that they are doing something wrong ("Keep your bow arm up until the arrow hits the target.")

- The Cookie - Follow-up with a compliment specific to the skill that you have just taught them. ("Your bow-arm looks much more solid now. Good shot!")

At no time do you ever need to tell an archer what they are doing wrong.

9.4 Problem correction for each step of shooting

The Instructor should discuss common problems and corrections for each step of shooting.

The instructor will go over each step of shooting, this time pointing out common faults that beginners make, and explain how to correct them properly with positive instructions. The Instructor may use volunteers to act as students learning to shoot.

9.4.1 Stance

Feet too far apart:

- Move your feet closer together.
- Keep your feet shoulder width apart.

Standing too open or too closed:

- Stand sideways to the target.
- Demonstrate with arrow on the ground pointed towards the target with their toes touching it.

Posture problems:

- Stand up straight and tall with equal weight on your feet.

Moving feet between shots:

- Keep your feet still or in place" or "Glue (or nail) your feet to the ground" - show how it effects body alignment.
- Mark your foot positions.

Both feet in front of or behind the shooting line:

- Put one foot on each side of the line.

9.4.2 Nocking the arrow

Putting the arrow anywhere except on the arrow rest, i.e. on top of or through the sight ring. On shelf, on knuckle:

- Put the arrow on top of the arrow rest for them so they can see what it looks like. Watch the next shot to see that they do it correctly.

Nocking the arrow anywhere but tight in between the nocking points; not snapping it on;:

- Snap the arrow on the string tight up against the nock locator for them so they can see what it looks like. Watch the next shot to see that they do it correctly. (Note that while it is

recommended all bows have two nocking points, if there is only one, ensure the arrow goes underneath the nocking point).

9.4.3 Set string fingers

Hooking the string with the whole hand, too many or too few fingers, hooking only on the finger tips:

Shape hand into proper position and hook on string with the string in the first groove of each finger.

This is good to show as an example as it is difficult to explain this skill. Hands-on is necessary.

Pinching the arrow so it comes off the arrow rest; may be caused by too much tension in the back of the hand-gripping with the back of the hand, or holding the arrow too tight between the fingers:

For the first go, try three fingers under the arrow for new shooters. Next, have them relax the back of their hand and keep their fingers away from the arrow. They may also use a tab with a finger spacer, or put something between the fingers to keep them separated.

9.4.4 Set bow hand

Holding with thumb only;

Gripping with the whole hand/heeling;

Gripping the bow too low (common on straight fiberglass bows with flat grip):

- Place hand in proper position.

9.4.5 Pre-draw

Raising or moving bow shoulder forward when raising bow arm:

- Keep your bow shoulder down.
- Put your hand on their bow shoulder.

Many kids do not have the muscle awareness to hold their bow shoulder down. Sometimes it helps to have them hold their bow arm out and raise their shoulder up at high as it will go. Then tell them to pull it down and hold it there. That is where they want to keep it while shooting.

Locking front elbow:

- Explain elbow rotation.
- Explain the ‘slight bend’ method, explaining that a straight arm is better than hyperextending.

Leaning back when raising bow arm:

- Stand up straight and tall, shoulders above hips above feet.
- Place your hand on their right hip and under left arm and stand them up straight (right-handed archer).

General Alignment problems:

- Mould them in to a "T”.

9.4.6 Draw

Drawing bow with low string hand elbow:

- Keep your elbow up and lift elbow to parallel.

Moving head forward to meet the string:

- Keep your head straight and pull the string all the way back to your face.

9.4.7 At full draw

Canting:

- Keep your bow straight up and down.

Creeping:

- Continue pulling with one motion all the way through the release.

Leaning forward-nose dive:

- Stand up straight, keep your bottom under your head.

9.4.8 Reference

Inconsistent:

- Explain how the arrow goes where it is pointed.
- Help archer find a consistent reference. Third joint of index finger underneath jaw line (good bone-on-bone contact).

9.4.9 Aim

Aiming with the wrong eye:

- This is hard to detect if you're not watching them from the front. One sure clue is the arrows going off the target to the left (for right-hand shooters). Check eye dominance, tell them to close left eye or watch string alignment.

String Picture:

- Line the string up with the edge of the sight window.

9.4.10 Release

Plucking:

- A form of collapsing where the hand goes out from the face. "Continue to draw the bow as you relax your fingers, keeping your hand close to your face."

Collapsing:

- Continue pulling, explain release control, how moving the release hand affects the shot.

Peeking:

- The archer is trying to watch the arrow fly. This shows up with the bow arm moving down and right, the head moving left. "Watch the centre of the target"

Gripping the bow:

- Keep your bow hand relaxed throughout the shot, or have them touch only index finger and thumb together around bow.

9.4.11 Follow through

Dropping bow arm:

- Keep your bow arm up until the arrow hits the target.

"YOUR ARROWS GO EXACTLY WHERE YOU SHOOT THEM."

9.4.12 Left vs. Right Handed Shooters

- This is a confusing subject for many new instructors. Have a right-handed shooter and a left handed shooter come to the shooting line and stand next to each other, face to face. Show them that a left handed shooter is a mirror image of a right handed shooter. A different bow is required if the bow has a sight window, or the arrow is placed on the same side as the bow arm. The finger tab is backwards, the arm guard is on the opposite arm, and the quiver is on the opposite side.
- Archers may get confused and have the arm guard on the wrong arm, the wrong bow, the wrong finger tab. or they may stand facing the wrong way on the line. The instructor must first determine if the archer is supposed to be shooting right or left handed (refer to eye dominance test). They may then sort the archer out to shoot in the right direction with the right equipment.

9.4.13 Coaching Positions

Explain the best positions to observe an archer and what to look for from each position. Use a student standing at a simulated full draw for an example:

- Directly behind archer – Good to view Alignment, Posture, Stance.
- Facing archer astride line – Good to view Reference point, Posture, Elevation of string elbow, Front shoulder position, Bow hand grip.

9.4.14 Arrow Patterns

- Explain how watching where the arrows go on the target face can be an indication of the shooting form problem.

9.4.15 Injury Prevention

If a student advises of pain, get them to stop shooting. If pain continues, seek medical assistance.

String interference with chest:

- Keep upright when shooting (i.e. not leaning away from the target).
- Bring your shoulders in line with your front arm.

10 Problem Correction Activity

In this section, candidates will have a go at practical problem correction with the other candidates.

The Instructor should break the students up into pairs. They will practice teaching as if their students were kids that have shot for a few days or weeks. Do this for 4 ends so they get used to the rotation. Then go to the next section.

Candidates should be sure that they are using the OREO Technique. Candidates may take turns as range officers or practice running the range. They should take turns coaching/shooting and should rotate partners after every 2 ends.

Assign Common Errors - The "What's wrong with this picture?" game.

The Instructor will assign common faults to one half of the group while the other half is pulling their arrows. Ask the archers that are pulling the arrows to wait at the targets, facing towards the back, while you talk to the new archers with their bows in their hands. The coaches will then have to identify what the errors are, and correct the student using the OREO technique.

Here are some ideas:

(Assign the whole group to do something wrong, and then assign individuals common errors from the last section. Here are some ideas for the whole group, assign only one each end:

- Have everyone stand behind the shooting line.
- Have everyone push the arrows off of the string with their thumbs while at rest.
- Put the arm guards and finger tabs on the wrong hands.
- Hold the bows upside down.
- Stand facing the opposite direction that they normally face.

Note: it is important for all coaches to understand when a different level of expertise is required, i.e. sometimes a more experienced coach or second opinion is required.

11 Equipment

In this session, the candidates learn about basic recurve equipment.

11.1 Recurve Bow

See Figure 3 below for a diagram of basic recurve equipment.

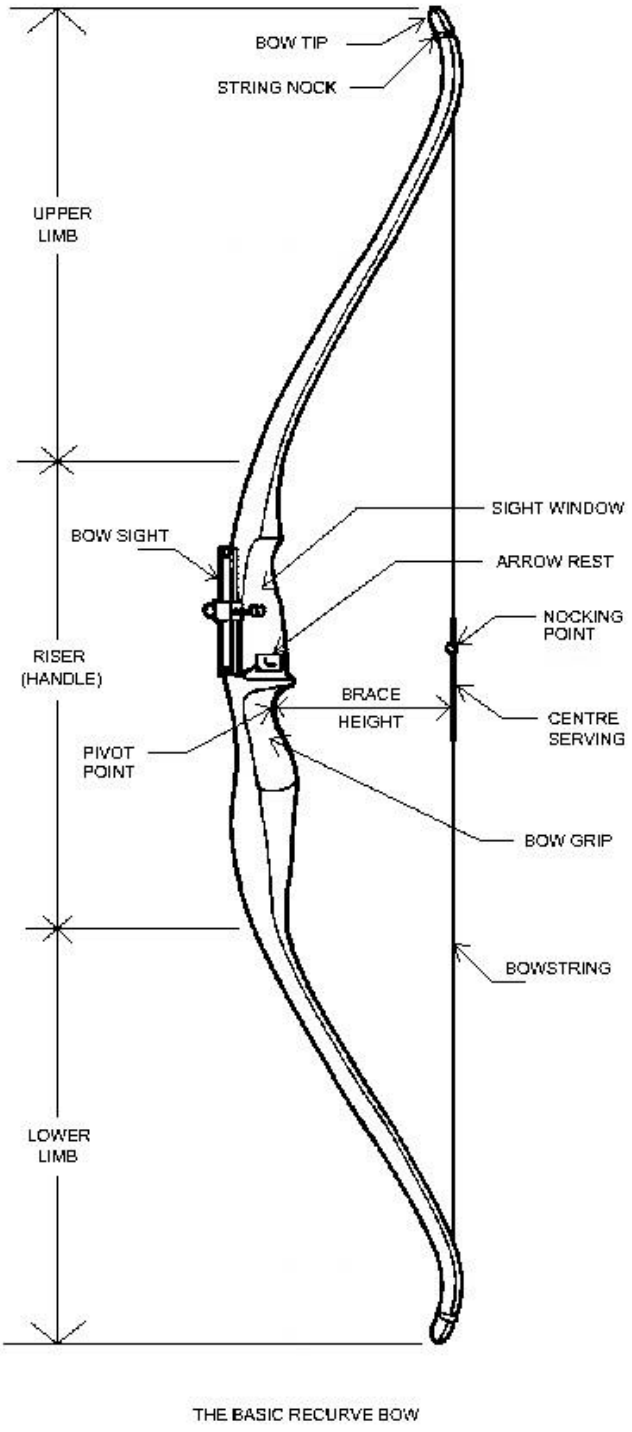


Figure 3: Recurve Bow Diagram

11.2 Arrows

See Figure 4 below for a diagram of an arrow.

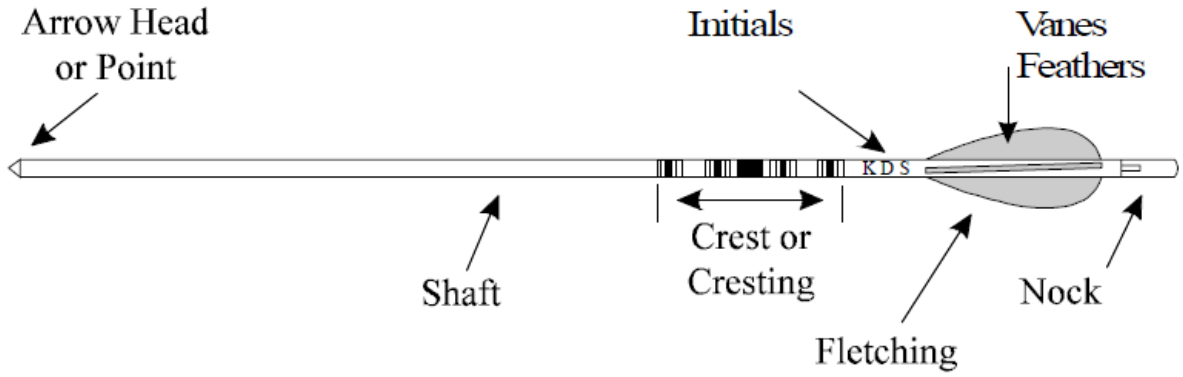


Figure 4: Arrow Diagram (World Archery Level 1 Coaching Manual)

11.3 Equipment Selection for Programs

The more time the students spend at the archery range the better equipment they should have.

11.4 How to order equipment properly

Lower poundage bows – 16#, 66" bows are ideal for a majority of beginners. Higher poundage can make it more difficult to attain proper technique, and will increase the risk of injury. Discuss your requirements and likely ages of participants with a dealer to identify the most ideal range of bow lengths and poundages. It may be useful to keep a couple of light-poundage bows (~12#) for weaker archers, and a couple of longer bows (70") for those with very long draw lengths.

A price list may be used to discuss each piece of equipment; the course instructor can explain what features to look for, and which ones work the best.

A cheaper item can cost more because it needs to be replaced more often. There are pitfalls of buying cheap equipment that does not last.

11.5 Bows

Inspection: Make sure the bows are not cracked and that there are no fiberglass splinters sticking out of limbs.

Fiberglass splinters can be extremely dangerous and need to be taken care of before the bow is used. Talk to your local dealer about what repairs can be undertaken.

11.6 Strings

It is recommended that proper strings be purchased for bows (must suit the length of their bow). Although a 12 strand Dacron string is recommended for heavier bows, they work very well on lighter (and older) bows. They will last many years, and because they are so thick, they are easy on students' fingers. The arrows also snap on to the thicker string making it easier for the students to shoot.

Recurve bows should be strung with any type of stringer, including cord stringer (Figure 5), or wall stringer (Figure 6). Show them how to use a cord stringer, and have them practise at the end of the class when putting bows away.

Figure 5: Recurve Cord Stringer (WA Level 1 Coaches Manual)

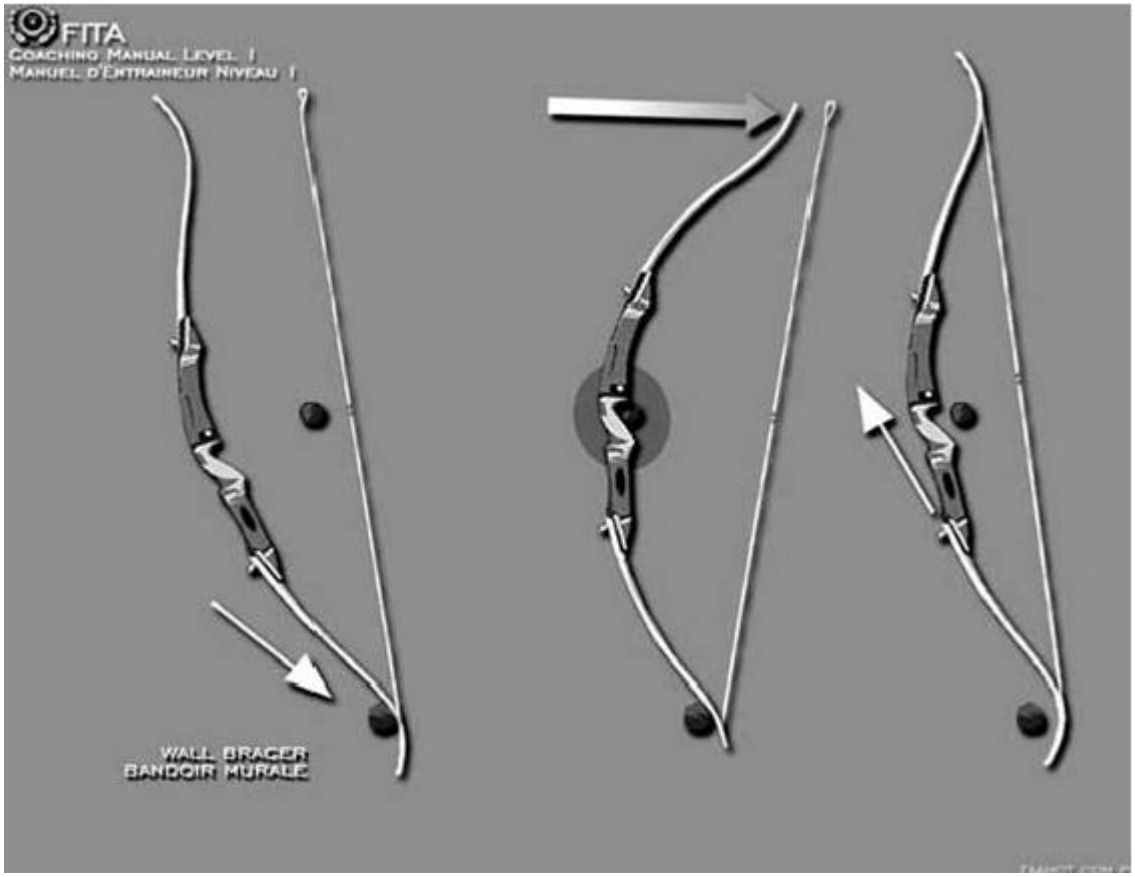


Figure 6: Wall Stringer (WA Level 1 Coaches Manual)

A string should have a big loop and a little loop. After applying pressure to the limb, the string tension will relax, and the big loop can be slid over the top limb of the bow. That is why it is made bigger. Then you put the bottom loop in the lower limb string notch, with the string on the face of the bow- It is difficult to tell which side is the face on some older fibreglass bows. Sometimes the limbs are so straight; you have to look at the grip to determine which side is the face. It is common for camps to string bows in the wrong direction. This can be dangerous, because the string may slip off of the tips easily.

Once a string is put on a bow and is set up, it should never come off of the bow. The bow should be strung and unstrung by sliding the top loop over the upper limb (unlike in Figure 6 above). Store the bow with the string attached. This will save a great deal of time between sessions if strings are normally taken off of the bows and stuffed in a can for the mice to make a nest out of.

Strings should generally have about 12-20 twists in them. After twisting, they can be given a very light coating of wax (candle wax is an acceptable alternative to commercial string wax), and burnished gently with some leather or similar to melt the wax in between the fibres. Strings should be waxed every month or more often if used frequently. Waxing the string helps to lubricate the various strands and to water-proof the string – this prolongs the life of the string.

11.7 Nocking Points

The instructor should show how to put on a nocking point. This should be required on all bows. Tie-on nocking points are recommended over metal nocking points – a top and bottom nocking point

will ensure good arrow location on the string. This one item will greatly improve the accuracy of the bows and make it much easier for the students to shoot, especially with three fingers under the arrow. If an arrow is nocked too low on the string because there is no nocking point, the arrow will fly out of the bow with the nock end low, which may cause the fletching to cut the archer's hand.

All bows need to have an arrow rest or something that holds the arrow up on the bow. Without an arrow rest the archers will use their fingers to hold the arrow up. This is very dangerous, and may cause splinters from the arrow or the fletching to cut the hand.

11.8 Arrow Rest

Arrow rests can be purchased from archery dealers. There is a variety, look for the rests to be robust so that they don't bend with large diameter arrows.

To replace a stick on arrow rest, it is most important to clean the area thoroughly with Isopropyl Alcohol and a cloth.

11.9 Sight

A simple sight can be made with tape and a pin. Weather stripping works well for this. The pin in the direction of the error to move the group into the middle of the target (i.e. if the group is in the bottom left of the target, move the pine down and left. This has the effect of pointing the bow further up and right).

Basic sights can also be purchase relatively cheaply.

11.10 Arrows

Some coaches may opt to send arrows away to archery shops for repair, but coaches should know the principles of how to fletch and nock arrows.

11.10.1 Inspection

Arrows should be inspected to make sure that they are reasonably straight, have 3 fletches and the nocks are not cracked or broken. If using carbon arrows, bend the arrows slightly and rotate them to make sure that they are not cracked. Cracked or broken arrows that are not repairable should be carefully broken in pieces (so they can't be used) and safely thrown away.

Note that carbon arrows should generally not be used for beginner courses due to the higher risks of carbon splinters if mistreated. Aluminium arrows are instead recommended for beginner courses.

11.10.2 Fletching

The following instructions are for preparing aluminium, fibreglass, carbon and aluminium-carbon arrows. Unless the fletching jig has an adjustable indexing feature, fletch the arrows with the nocks temporarily installed, fletch, index and bond the nocks so that vanes clear the arrow rest. You can wipe just the area of the shaft to be fletched with lacquer thinner, acetone or Methyl Ethyl Ketone (M.E.K.) until no residue shows on a clean, white paper towel. Wipe the base of the vanes with lacquer thinner acetone or M.E.K as oil on the base of some vanes can prevent adhesives from adhering to them.

When preparing for fletching, observe these precautions and instructions.

1) Do not touch cleaned areas with hands or other objects.
2) Fletch as soon as possible. If shafts stand unfletched for over 8 hours, repeat the cleaning process.
3) Shafts cleaned in the above manner can be fletched directly using fletching glue.
4) Do not attempt to fletch on humid days.

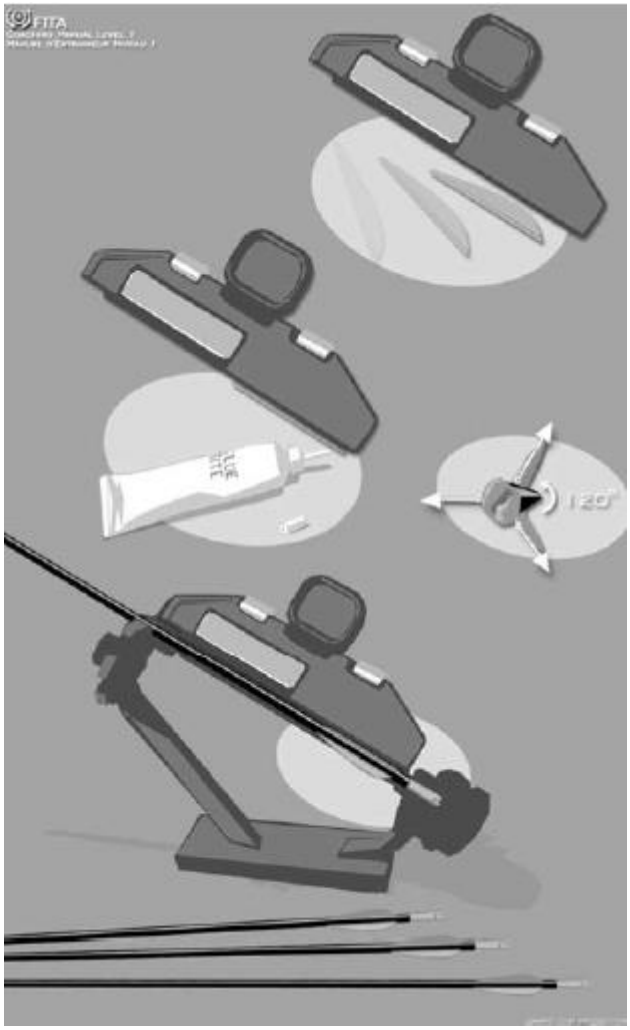


Figure 7: Fletching Arrows (World Archery Level 1 Coaches Manual)

11.10.3 Removing Broken Nocks from Swage-Fitting Aluminium Arrows

Soften the nock over a heat source and gently seize with softened plastic pliers and twist off. Clean the nock swage as described below. Nock remnants should be cut off with a knife carefully. The shaft nock taper should never be sanded or scraped as this can distort the cone shape and put flat spots on the cone which can adversely affect nock straightness.

11.10.4 Attaching Nocks to Aluminium Shafts

Correctly aligned nocks are as important for shooting accuracy as a good bowstring, straight arrows or other equipment. A nock misaligned just a few thousandths of an inch can affect the point of impact on the target by as much as 6 inches at 40 metres.

1) If an old nock has been removed, use lacquer thinner, acetone or M.E.K. on a clean, white paper towel and wipe the tapered end of the shaft until it is clean and free of old glue. Hold

the shaft in one hand and rotate it against the folded paper towel. Repeat this until all glue and nock remains have been removed.

2) Apply a large drip of fletching glue to the clean nock taper surface.
3) Spread an even layer of glue around the taper.
4) Quickly press the nock on the taper.
5) Rotate the nock several times counter-clockwise to spread the glue evenly. Then rotate the nock clockwise until the nock groove is properly aligned and the nock is firmly seated on the taper.
6) Wipe the excess cement from the nock base and allow drying at least two hours before shooting.

11.10.5 Dot the Fletches

Most manufacturers do not dot the arrows after fletching them. This is done by putting a drop of glue at the ends of each fletch or vane so that the glue is on the shaft and the fletches. This will help keep the fletching on much longer.

11.10.6 How to Care For and Store Archery Equipment

There two ways to store bows:

- Hang bows with the strings attached on wooden pegs (dowels) or nails wrapped with tape.
- Hang horizontally with limb tips pointing down, supported mid-limb by two dowels.

Note that in case your place of archery is broken into, it would be wise to lock equipment inside an armoury or similar.

If equipment becomes wet, it should be dried before being put in storage to prevent metal rusting and water damage to the wooden parts.

12 Archery Programme Development

In this section, candidates learn about methods for developing an archery programme for beginners.

12.1 Class Discussions Instruction/Planning

Plan classes depending on their situation and how long the students get to shoot each day and how many days.

Discuss different situations and how you would organise the classes. This should include handing out equipment, and a review of range control, rules, and the steps of shooting.

12.1.1 Variety and Fun

Discuss variety in the programs and how it can keep them from getting bored with archery

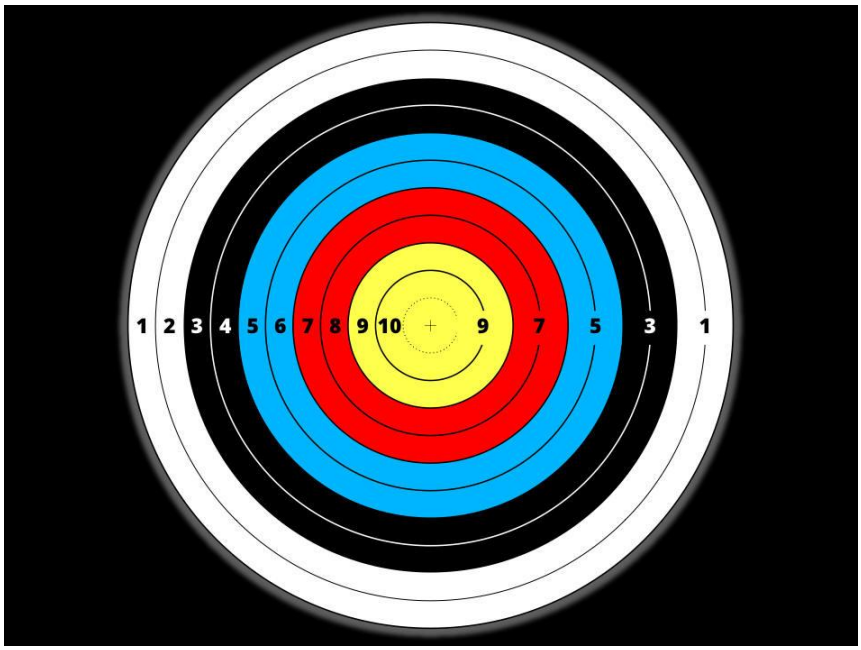
The purpose of this section is to motivate the candidates to be creative in finding ways to help the students enjoy and have fun with archery.

12.1.2 Scoring Rounds

Have the students score a short round depending on how much time is available.

If using a World Archery target face, 10 zone scoring is undertaken as follows:

Centre Gold	X (scored as ten points, but Xs counted as tie-breakers)
Inner Gold	10
Outer Gold	9
Inner Red	8
Outer Red	7
Inner Blue	6
Outer Blue	5
Inner Black	4
Outer Black	3
Inner White	2
Outer White	1



5-zone scoring is an alternative which can be undertaken with colours only (i.e. 9, 7, 5, 3, 1 for gold, red, blue, black, white).

12.1.3 Achievement Programs

In achievement programs, the students are competing against themselves for a score goal. There are formal systems, such as JAMA. Recommend that they start the club achievement program if one is available.

12.1.4 Competitions

Archery is an Olympic sport, and competitions should be a part of any archery program. Competitions should not be overdone though. Recommend one major competition per week or session. They can really play it up to make it a fun event for all of the students. Some clubs also compete against other clubs.

12.1.5 Games

Tell the group about a few archery games that you know. Invite them to share any games they have and to make some up. They may create games. There are a few key items that must be remembered when playing archery games.

- The games must match the ability of the shooters. Be careful not to make games too difficult.
- Many games may look easy (like lots of small targets) but are actually very difficult - this is how carnival games make so much money.
- The students cannot shoot well enough to intentionally hit a small target, so it becomes a game of luck- If the targets only cover 5% of the area. You can only expect them to hit it 1 out of 20 times.
- If a game is too difficult, move the archers closer. If it is too easy, or as their skills progress, move them back.
- Always follow the Archery Range Rules and Procedures when teaching games. Always enforce all of the rules.
- When putting balloons or other items on a target, keep them in the middle 50% of the target butt. If you place items near the edge of the target, the arrows will miss and time will be wasted searching for arrows.
- Where will the missed arrows go? Make sure that there is a safe area behind the targets, and that the arrows will not become lost or damaged.

End a game while the students are still enjoying it. Let them know when this will be the last end. Always leave them wanting more.

Candidates should discuss the importance of games and when to play (each shooting session should finish with game).

Note: If a break is needed during this course, the Instructor may choose to play some archery games. Some suggestions are as follows:

- Get archers to shoot all their arrows, then draw cards to select the score for each colour.
- Run a knock-out 1-arrow match play, where archers must shoot on the target to move to the next round, getting gradually more difficult, and ending with needing to shoot within the gold to stay ‘in’.
- Balloon shoot.
- Team match play – cumulative score of each team wins.

13 Example Group Instruction

In this section, each candidate will teach a Safety/Orientation Class to the group. The group will evaluate and discuss each presentation.

The Instructor will break the class up into small groups to teach the safety/orientation class so no more than 5 or 6 classes are taught. For this exercise, candidates will start off teaching the class assuming that all of the equipment has been handed out. The rest of the group will be the students. After each candidate or group completes their safety/orientation class through the pulling of the arrows, the class will evaluate and discuss their presentation. The class should use the Oreo technique when evaluating the presentations. It is important at this time to note candidates' control of the group, handling situations as they arise. For fun, the group that is shooting may be assigned to act in one of the following manners:

- 7 year old Cub Scouts
- 13 year old giggly kids who would rather be at the mall
- 80 + year old senior citizens from a nursing home
- 18-22 year old Foreign exchange students who understand English, but cannot speak it.
- 16 year old inner-city gang members in a police program

This role playing exercise can be fun as well as educational. The candidates will provide more distractions than a normal group of students.

14 Have-A-Go Sessions

When conducting a "Have-A-Go" session, where archers will generally shoot just a handful of arrows as a 'taster' of the sport, different procedures are usually used.

14.1 Have-A-Go Range Set-Up

Any new location to be used for an archery session (or where a coach is new to the location) will need to be inspected before the day of the event. Safety must be paramount. Targets can be placed on the ground and back stop netting used to improve safety.

In order to get people through a have-a-go session, it is useful to have prepared the range in advance, with bows and arrows ready to use.

As always, start close – 5m is an appropriate distance. If there is an elevated risk of bounce-outs which would make 5m dangerous to the archers, increase to a safe distance.

14.2 Have-A-Go Equipment

To remove the requirement for matching arrows, use as long a set of arrows as is available. When a tall person comes to shoot, double check whether the arrows are suitable, or get them to bend their front arm.

It is easiest to reduce the amount of equipment used – i.e. no finger tab or finger sling. Armguards may be used if there is time, but if not, the coach must ensure that the archer's arm is well out of the path before shooting.

It is recommended that for Have-A-Go events, archers use three fingers underneath the arrow. This is easier and faster to understand.

14.3 Have-A-Go Safety

Because of the condensed nature of events, Have-A-Go sessions have a number of additional safety requirements which must be managed:

- As all archers will generally be shooting for the first time, Have-A-Go sessions should generally be run with one-on-one coaching.
- Coaches should retrieve the arrows themselves, as it is dangerous for first-time archers to come in front of the waiting line without a proper safety briefing.
- Ensure that participants cannot fire when coaches are collecting arrows by either removing arrows from the line, or having a dedicated range captain.
- Be aware of archers overdrawing.
- Be aware of archers drawing above the target.

15 Knowledge of Governing Bodies and Competitions

15.1 Archery New Zealand

Archery New Zealand (ANZ) is an Incorporated Society and is the recognised governing body of Archery in New Zealand. It is affiliated to the International Federation - World Archery (WA), World Archery- Oceania and the New Zealand Olympic Committee. It works closely with Sport New Zealand (formerly SPARC). Archery New Zealand holds annual National Championships for Target, Field, Clout and Indoor Archery.

ANZ's website is found here:

http://www.archerynz.co.nz/

15.2 World Archery

The international governing body of archery is the World Archery Federation or WA (previously FITA), website found here:

http://www.worldarchery.org/

15.3 Target Rounds

Common target rounds shot at competitions include the following:

15.3.1 WA 1440

A WA 1440 consists of 36 arrows at each of 90, 70, 50, and 30m for men, and 70, 60, 50 and 30m for women. The first two distances are shot on 122cm target faces, and the last two distances on 80cm targets (10 zone scoring). Shorter rounds are shot by some juniors and masters.

Archers have 40 seconds per arrow.

15.3.2 WA 720

A WA 720 consists of 72 arrows at 70m for recurve (122cm target), and 50m for compound (80cm target). Shorter rounds are shot by some juniors and masters.

15.4 Match Play Rounds

Most international and national tournaments are decided with a match play event. Match play is a knock-out event similar to tennis, with ranking decided with a qualification event. Medal matches are shot arrow-by-arrow, with 20 seconds per arrow.

15.5 Field Rounds

In field rounds, archers progress through a course of targets, some shot uphill or downhill. Rounds are shot at either targets, or 3D foam animals, and originated as a practice round for hunting. In some cases, archers need to estimate the distance to the target.

15.6 Clout Round

Clout originated from when longbows were used in warfare. Arrows are shot in the air at a large target on the ground.

DEVELOPMENT COACH MANUAL – ADDITIONAL MATERIAL

16 Equipment and Selection

16.1 Recurve Equipment

In addition to the simple diagrams shown in the Foundation Manual, see Figure 8 below for a diagram of a more common recurve setup for a club archer:

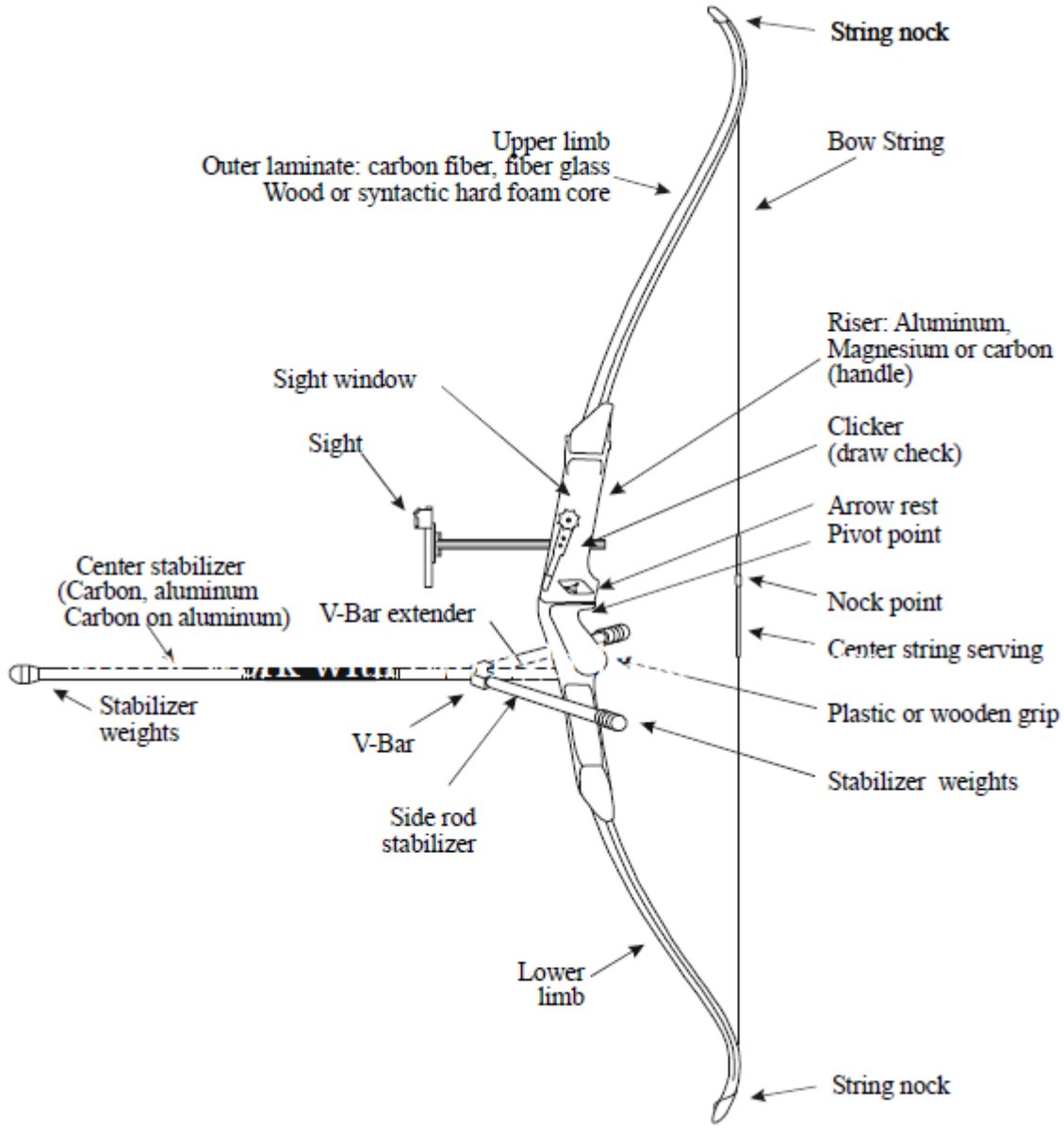


Figure 8: Recurve Equipment (World Archery Level 1 Coaching Manual)

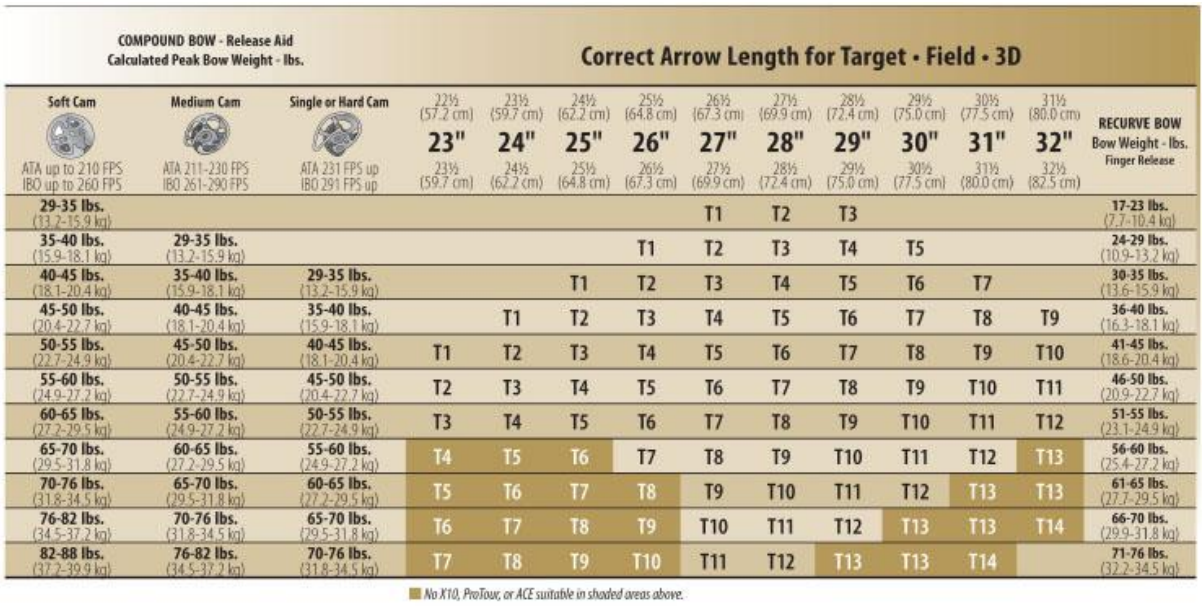
16.2 Arrows

Candidates should be able to use an arrow chart to select an appropriately-spined arrow for the purpose. Candidates should be aware of:

- Calculating the correct draw length - measured from throat of the nock to the cushion plunger hole plus 1 ¾". This can be approximated as being in line with the furthest part of the handle from the archer.

- Allowance of 2"+ for juniors' arrows when they are growing.
- Understanding that an increase in draw length increases the draw weight of a bow (approximately 1-2# per inch).

See Figure 9 below for an example arrow selection chart.



COMPOUND BOW - Release Aid Calculated Peak Bow Weight - lbs.			Correct Arrow Length for Target • Field • 3D										
Soft Cam ATA up to 210 FPS IBO up to 260 FPS	Medium Cam ATA 211-230 FPS IBO 261-290 FPS	Single or Hard Cam ATA 231 FPS up IBO 291 FPS up	22½ (57.2 cm) 23" (59.7 cm)	23½ (59.7 cm) 24" (62.2 cm)	24½ (62.2 cm) 25" (64.8 cm)	25½ (64.8 cm) 26" (67.3 cm)	26½ (67.3 cm) 27" (69.9 cm)	27½ (69.9 cm) 28" (72.4 cm)	28½ (72.4 cm) 29" (75.0 cm)	29½ (75.0 cm) 30" (77.5 cm)	30½ (77.5 cm) 31" (80.0 cm)	31½ (80.0 cm) 32" (82.5 cm)	RECURVE BOW Bow Weight - lbs. Finger Release
29-35 lbs. (13.2-15.9 kg)							T1	T2	T3				**17-23 lbs.** (7.7-10.4 kg)
35-40 lbs. (15.9-18.1 kg)	**29-35 lbs.** (13.2-15.9 kg)					T1	T2	T3	T4	T5			**24-29 lbs.** (10.9-13.2 kg)
40-45 lbs. (18.1-20.4 kg)	**35-40 lbs.** (15.9-18.1 kg)	**29-35 lbs.** (13.2-15.9 kg)			T1	T2	T3	T4	T5	T6	T7		**30-35 lbs.** (13.6-15.9 kg)
45-50 lbs. (20.4-22.7 kg)	**40-45 lbs.** (18.1-20.4 kg)	**35-40 lbs.** (15.9-18.1 kg)		T1	T2	T3	T4	T5	T6	T7	T8	T9	**36-40 lbs.** (16.3-18.1 kg)
50-55 lbs. (22.7-24.9 kg)	**45-50 lbs.** (20.4-22.7 kg)	**40-45 lbs.** (18.1-20.4 kg)	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	**41-45 lbs.** (18.6-20.4 kg)
55-60 lbs. (24.9-27.2 kg)	**50-55 lbs.** (22.7-24.9 kg)	**45-50 lbs.** (20.4-22.7 kg)	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	**46-50 lbs.** (20.9-22.7 kg)
60-65 lbs. (27.2-29.5 kg)	**55-60 lbs.** (24.9-27.2 kg)	**50-55 lbs.** (22.7-24.9 kg)	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	**51-55 lbs.** (23.1-24.9 kg)
65-70 lbs. (29.5-31.8 kg)	**60-65 lbs.** (27.2-29.5 kg)	**55-60 lbs.** (24.9-27.2 kg)	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	**56-60 lbs.** (25.4-27.2 kg)
70-76 lbs. (31.8-34.5 kg)	**65-70 lbs.** (29.5-31.8 kg)	**60-65 lbs.** (27.2-29.5 kg)	T5	T6	T7	T8	T9	T10	T11	T12	T13	T13	**61-65 lbs.** (27.7-29.5 kg)
76-82 lbs. (34.5-37.2 kg)	**70-76 lbs.** (31.8-34.5 kg)	**65-70 lbs.** (29.5-31.8 kg)	T6	T7	T8	T9	T10	T11	T12	T13	T13	T14	**66-70 lbs.** (29.9-31.8 kg)
82-88 lbs. (37.2-39.9 kg)	**76-82 lbs.** (34.5-37.2 kg)	**70-76 lbs.** (31.8-34.5 kg)	T7	T8	T9	T10	T11	T12	T13	T13	T14		**71-76 lbs.** (32.2-34.5 kg)

No X10, ProTour, or ACE suitable in shaded areas above.

Figure 9: Arrow Selection Chart

16.2.1 Arrow Selection Worked Example

As an example, an archer has a 26 ¼" draw length, and shoots a recurve bow that is marked 30#. The 30# marking on the bow indicates that it measures 30# at a standard 28" draw length. As the draw length is shorter than 28", the poundage will be lower than the marked 30#. For approximately 1-2# per inch, we can expect a poundage of about 3# less than 30#, so say 27#.

A draw weight of 27# puts us in the second row (between 24-29#). As 26 ¼" draw length is between 25 ½" and 26 ½", it puts us in the 26" column. This intersects at T1, which is a group of arrows of equivalent spine, usually provided in another table by the manufacturer.

Some key points to note when selecting arrow spines:

- Arrow charts are only approximations of the spine required – there are a number of variables affecting the required spine, including archer technique, so use with care.
- Arrow spines usually get lower as they get stiffer – this is because the spine measurement is often a measurement of how much a horizontal arrow will bend when a force is hung on it.
- If you fall part-way between two groups, it is suggested to go for the stiffer of the two spines – especially if an archer is growing and may increase in draw length and/or draw weight.
- Arrow charts generally intend for the arrow length to be equivalent to the draw length. With growing archers, it is common to select an arrow that is longer than their draw length. Note that this may cause the arrow to react as if it were a weaker spine.
- Arrow length does not include the point of an arrow – it stops at the front of the shaft.

16.3 Bow Length

The preferred length of the bow partially depends upon the archer's draw length, since people with a short draw should get optimum performance with a shorter bow. Likewise, a person with a long draw would be better with a longer bow.

Recommended bow lengths are:

60-64" Draw 24" or less

65-66" Draw 25 - 26"

67-68" Draw 27 - 28"

69-70" Draw 29" or more

16.4 Bow Poundage

Always select a bow poundage that the archer is capable of using without straining their abilities. Don't select a poundage that an archer will struggle with for a year, but "grow into". This period can do a lot of damage to their technique, as well as quickly raise their risk of injury. Note that bow poundage is generally rated for a 'standard' 28" draw length. As per 16.1 Arrows, increasing draw length will increase poundage, and decreasing draw length will decrease poundage.

Some suggested limb ratings are as follows:

- Beginner courses 16#
- Purchasing first bow (Recurve) 24#
- Purchasing first bow (Compound) 30#

These draw weights are nominal, and of course depend on the archer's age, strength, size, and any physical conditions. If in doubt, err on the lighter side.

Many archers will find it 'macho' to have a high draw weight, but it is the coach's responsibility to keep them to a draw weight that will not compromise their safety and performance.

After the selection of their first bow, archers should generally only increase bow poundage in increments no larger than 2# at a time, especially at the higher draw weights. Unless the archers are world level, they will generally have no need for a recurve draw weight over about 42# (appropriate for an adult with 4-5 years' experience), and should easily make all distances with this.

16.5 Slings

Slings are generally not used for have-a-go sessions, as they can be cumbersome for a beginner to come to terms with. They are, however, necessary for competitive archers.

In order to ensure the bow hand and wrist do not twist the bow upon release (or worse, grab at it during the release) the wrist, bow hand and fingers will need to the relaxed before, during and after the shot. Note that the wrist can only be relaxed if it is placed in the correct location – see 21.2.3.

The sling should be loose enough such that it does not exert pressure on the fingers or wrist when at full draw, but tight enough so that with a relaxed wrist and fingers, the bow grip does not fall out of

the sling. About 10-20mm of play in a sling when at full draw is a suitable starting point. If an archer's wrist or hand stays tense during the shot and doesn't drop away like a relaxed hand should, try reducing the play in the sling. A sling that is too loose is not performing any function, and will lead to archers gripping the bow.

There are generally three types of slings:

16.5.1 Finger Sling

Finger slings can be purchased as per Figure 10, or alternatively made cheaply from a knotted shoe lace, Figure 11. The sling should be attached to the thumb and index finger of the bow hand, behind the knuckle. The shoelace variety has the benefits of being self-tightening when pressure is placed on them, and also has a number of readily available spares if one is lost!

Note that placement of a finger sling on the middle finger is discouraged, as this often does not enable the archer to get a 45 degree angle across their knuckles, whilst at the same time being tight enough to function properly.

Figure 10: Pre-made Finger Sling

Figure 11: Finger Sling made from a Shoelace

16.5.2 Wrist Sling

Another type of sling is the wrist sling, as per Figure 12. They tie around the wrist, and have a cord that runs between the knuckles of the index and middle finger and attaches back to the wrist loop.

These can feel more secure for archers than finger slings, but often have more components that can break.

Figure 12: Wrist Sling

16.5.3 Bow Sling

Bow slings are a loop that attaches around the bow and wrist, usually secured at the stabiliser mount – see Figure 13. While common for compound archers, bow slings are not recommended, as they can cause the archers to tense their fingers to prevent the bow from falling away. If this movement were to pre-empt the shot, it would destabilise the aim.

Figure 13: Bow Sling

17 Recurve Bow Set-Up

17.1 Bow Basic Setup Checklist

- ✓ Tiller
- ✓ Brace Height set to manufacturer's specification
- ✓ Nocking point height
- ✓ Centre shot (cushion plunger length or launcher)

Note, for limb alignment, bare shaft tuning, paper tear tuning, and micro-tuning, refer to the Performance manual. There are also a number of good tuning guides available, e.g. Easton Tuning Manual.

17.2 Preliminary Bow Set-Up

Initial equipment preparation can eliminate most or all disturbances which cause tuning problems, including false tuning indicators. A false tuning indicator would be having a high nocking point indication when the problem is actually poor clearance.

17.3 Nocking Point (Recurve and Compound)

Install a nocking point on the bowstring. Initially, position the nocking point on the string about one-half inch above square for all finger shooters (RF, CF) and approximately one-quarter inch above square for compound release shooters (CR).

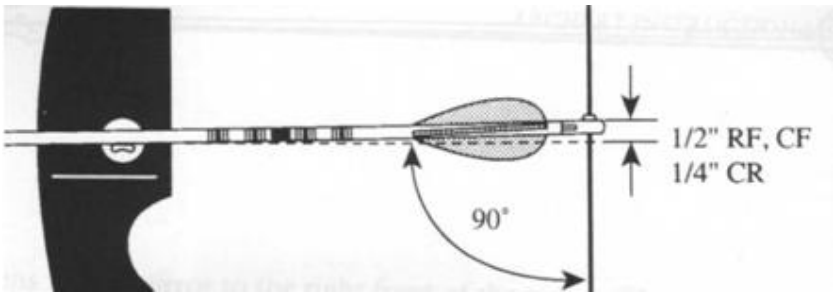


Figure 14: Nocking Point Position

17.4 Arrow Centring (Recurve and Compound)

Have students adjust the horizontal (in-out) position of the cushion plunger or arrow rest assembly so that the tip (centre) of the arrow point is correctly aligned for either recurve (see Figure 17) or compound (see Figure 16).

The objective of arrow centring is to have the arrow leave the "theoretical" or "balanced" limb centre of the bow. In reality, as the arrow oscillates, it is the two nodes of the arrow shaft that should leave the centre of the bow in direct alignment to the target.

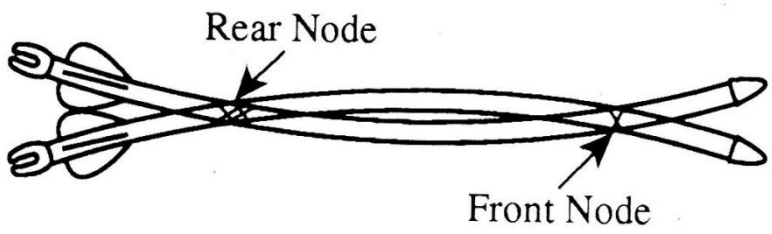


Figure 15: Arrow nodes, the front node is usually closer to the front of the arrow than the rear node is to the nock end due to the mass weight of the point – nodes are always located closer to the heavier mass.

To find the limb centre for recurve bows, stick masking tape across the inside of each limb a few inches from the riser. Mark a vertical line on the tape in the exact centre of each limb. Align bowstrings with these "limb centre" marks and adjust the in-out position of the arrow (using the cushion plunger or horizontal adjustment device) until the point is aligned approximately 1/8 inch outside the bowstring.

To find the balanced limb centre location for set-up of the compound bow put masking tape across the inside of each limb a few inches from the riser. Measure the width of the limb (at the tape) and mark the tape in the exact centre of each limb. Measure 3/16 inch to the left of the mark (for right-handed archers) and draw a larger vertical mark on the tape. For left- handed archers make a mark 3 /16 inch to the right of the centre limb mark. The second mark will be imprecise in the preliminary set-up stage, as the archer will locate the true balanced limb centre when fine tuning.

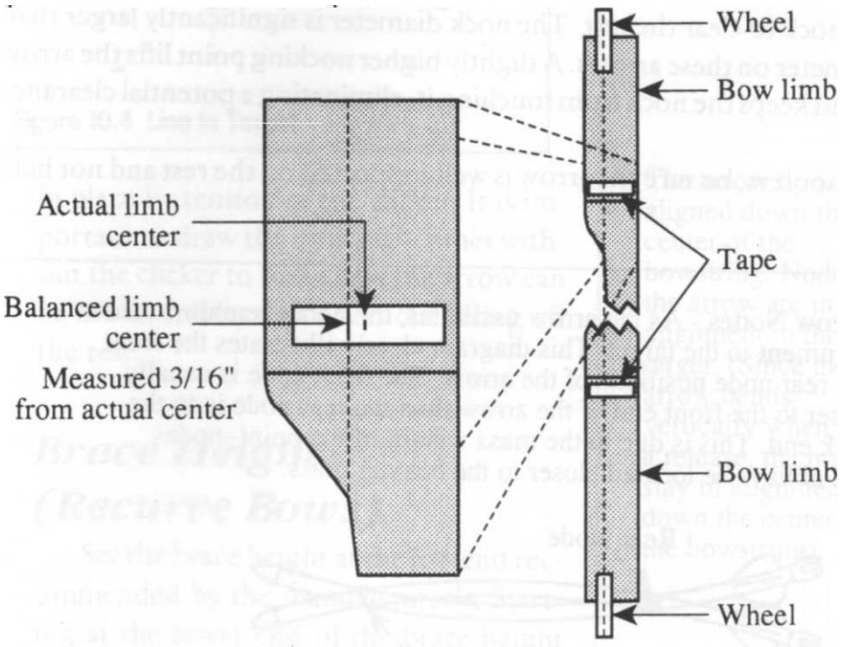


Figure 16: Compound Balanced Limb Centre

Finger release shooters should align the tip of the arrow approximately 1/8 inch or less outside the bowstring with the bowstring properly centred (to the left for right-handed archer). The arrow tip is slightly outside the string to compensate for the amount the cushion plunger or side loading device compresses in towards the bow when the arrow is released.

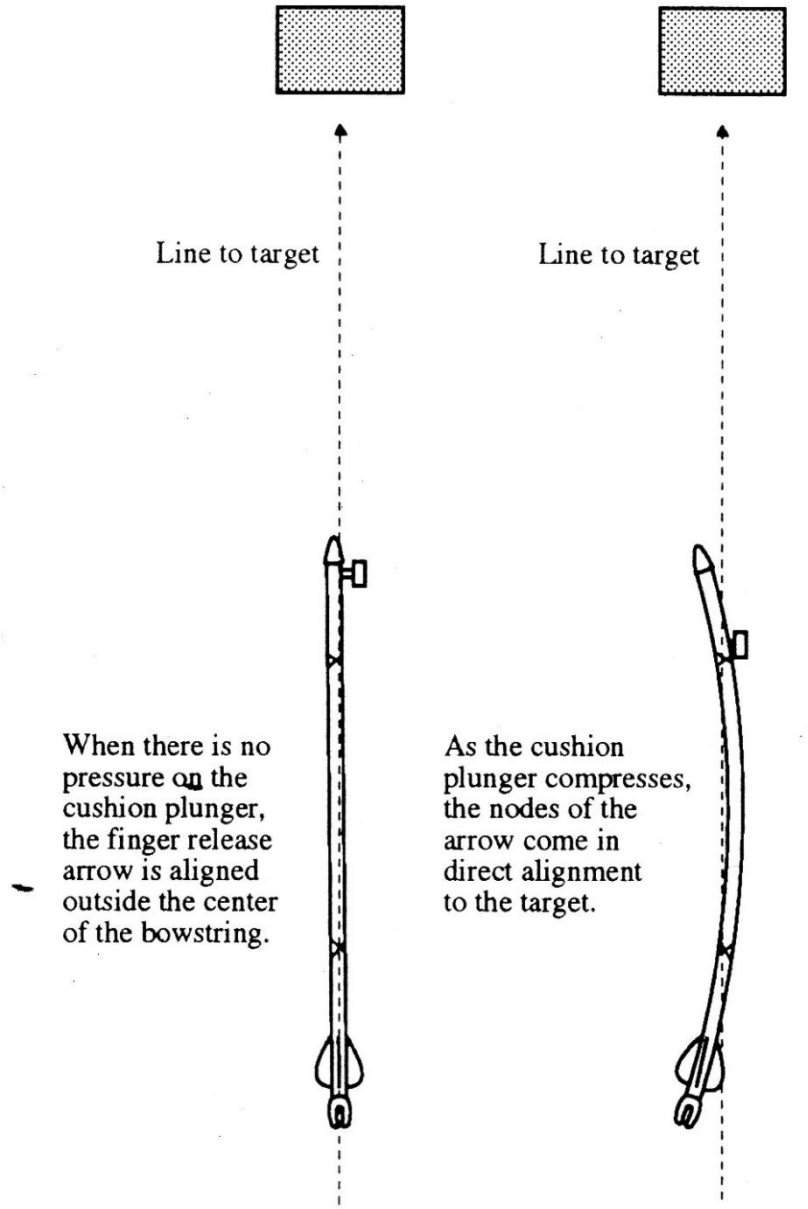

Line to target
Line to target
When there is no pressure on the cushion plunger, the finger release arrow is aligned outside the center of the bowstring.
As the cushion plunger compresses, the nodes of the arrow come in direct alignment to the target.

Figure 17: Line to Target

With a finger release, the arrow bends horizontally, first bending in towards the bow and then away from it, at which point the arrow shaft leaves the arrow rest. In the next bending sequence the arrow nock disengages from the string. The arrow is on its way, oscillating all the way to the target. Oscillation decreases as the arrow travels further from the bow. Mechanical release shooters should align the tip of the arrow down the string. The arrow centre line (axis) must start in a direct line with a bowstring when the string is aligned with the balanced limb centre. If misaligned, the alignment of the nodes will rotate during the release (see Figure 18 below).

When using a release, the arrow most often bends vertically, rather than horizontally. Therefore, there is no need to compensate for any inward compression of the arrow rest or cushion plunger. The arrow tip is aligned down the centre of the bowstring. Nodes of the arrow are in alignment with the target (since the arrow bends vertically when using a release, the nodes stay in alignment down the centre of the bowstring).

The following adjustments should be made during preliminary set-up of the bow. The sight pin should be set over the centreline of the arrow shaft. The cushion plunger is set at the medium spring tension. The arrow rest is critical to achieving good arrow clearance. For finger release archers, the arrow rest support arm should not be visible past the outside of the arrow shaft when observed from overhead. Mechanical release shooters using launcher type rests should be certain that the arrow support arm is narrow enough to allow the two lower vanes to pass over without contact. This is important to archers using release aids because the arrow most often is supported on the rest for its full length of forward travel. For the aluminium-carbon or all carbon shafts with less space between vanes, it may be necessary to reduce the width of the launcher blade.

It should be noted that when using all-carbon arrow shafts which have externally fitted nocks, it may be necessary to move the nocking point up slightly to allow the nock to clear the rest. The nock diameter is significantly larger than the shaft diameter on these arrows. A slightly higher nocking point lifts the arrow off the rest and keeps the nock from touching it, eliminating a potential clearance problem.

Clicker shooters, be sure the arrow is well supported on the rest and not held in place by tension of the clicker. It is important to draw the bow a few times without the clicker to make sure that the arrow can be drawn and let down without falling off the rest. Nock tension should be tight enough that the arrow can easily support its own weight when hanging vertically on the string (nock against the nocking point). To check if the nock is too tight, hang the arrow vertically on the string, and give the string a sharp tap with finger on the serving about one to two inches from the nock. The arrow should separate from the string.

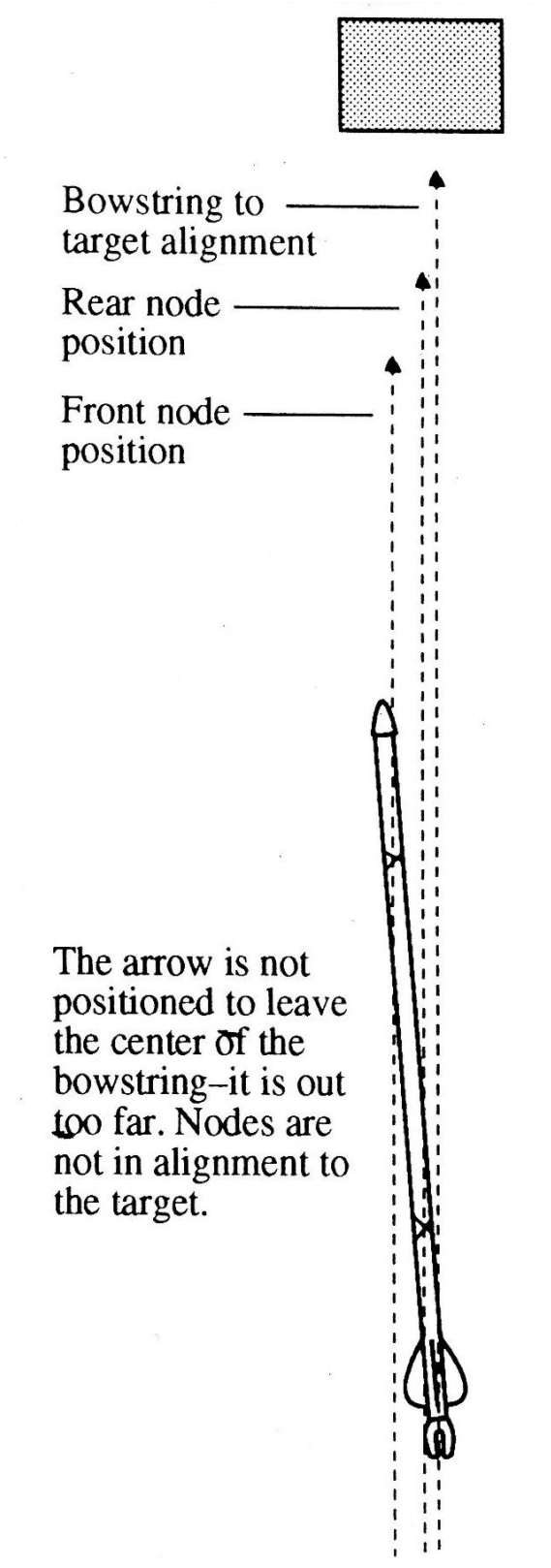

Bowstring to target alignment
Rear node position
Front node position
The arrow is not positioned to leave the center of the bowstring–it is out too far. Nodes are not in alignment to the target.

Figure 18: Misaligned Arrow

17.5 Brace Height (Recurve Bows)

Set the brace height at the low end recommended by the manufacturer. Starting at the lower end of the brace height range allows the archer to '"twist up" the bowstring to locate the optimum brace height for that bow.

Recurve Bow Length	Suggested Beginning Brace Height
64" 66"	8 1/4" - 8 1/2" (21.0 cm - 21.6 cm) 8 3/8" - 8 5/8" (21.3 cm - 21.3 cm)
68" 70"	8 1/2" - 8 3/4" (21.6 cm - 22.2 cm) 8 5/8" - 8 7/8" (21.7 cm - 22.5 cm)

Figure 19: Brace Height

All bows are different, even those of the same make and model. It is important to locate brace height that fits a particular bow and shooting style. Usually, this is when the bow sounds the quietest and feels the smoothest during a shot. Shoot a few arrows at the suggested bracing height, then unstring the bow, add 3-4 twists to the bowstring and shoot again. Continue this process until the bow feels smoothest and sounds quietest when shooting. If the string is too short to allow a brace height at the lower setting, use a slightly longer string. If the string is too long to allow a brace height (and starts to knot up from too many twists), try a slightly shorter string. There are many custom bowstring makers who produce strings to exact specifications (i.e. type of material, type of serving, serving colour etc.).

Brace height determines the point at which the arrow separates from the string and the amount of bend in the arrow at separation. The brace height for recurve or compound bows enables the most compatible launch position for arrows at the end of the bow's "power stroke". Locating the best brace height for a bow can significantly improve arrow grouping and shooting consistency.

Brace height for compound bows is set by the manufacturer. To adjust brace height, use the same procedure as described for recurve bows.

18 Compound Equipment

In general, the technique required to shoot a compound is almost identical to that for a recurve, with a few small variations. Compound equipment is primarily different from recurve in the use of a cam and pulley system (see Figure 20 below). Compound archers are also permitted to use mechanical release devices, magnified scopes, peeps and spirit levels.

While a Development Coach does not need to have an in-depth knowledge of compound equipment, it is useful to know the basics. In this way, a Development Coach will be able to ensure that a novice compound archer has the correct draw length, peep height, and show them how to use a release device properly. These simple things will ensure that a compound archer can start shooting comfortably (and well) even in the absence of coaches who are experienced in compound equipment.

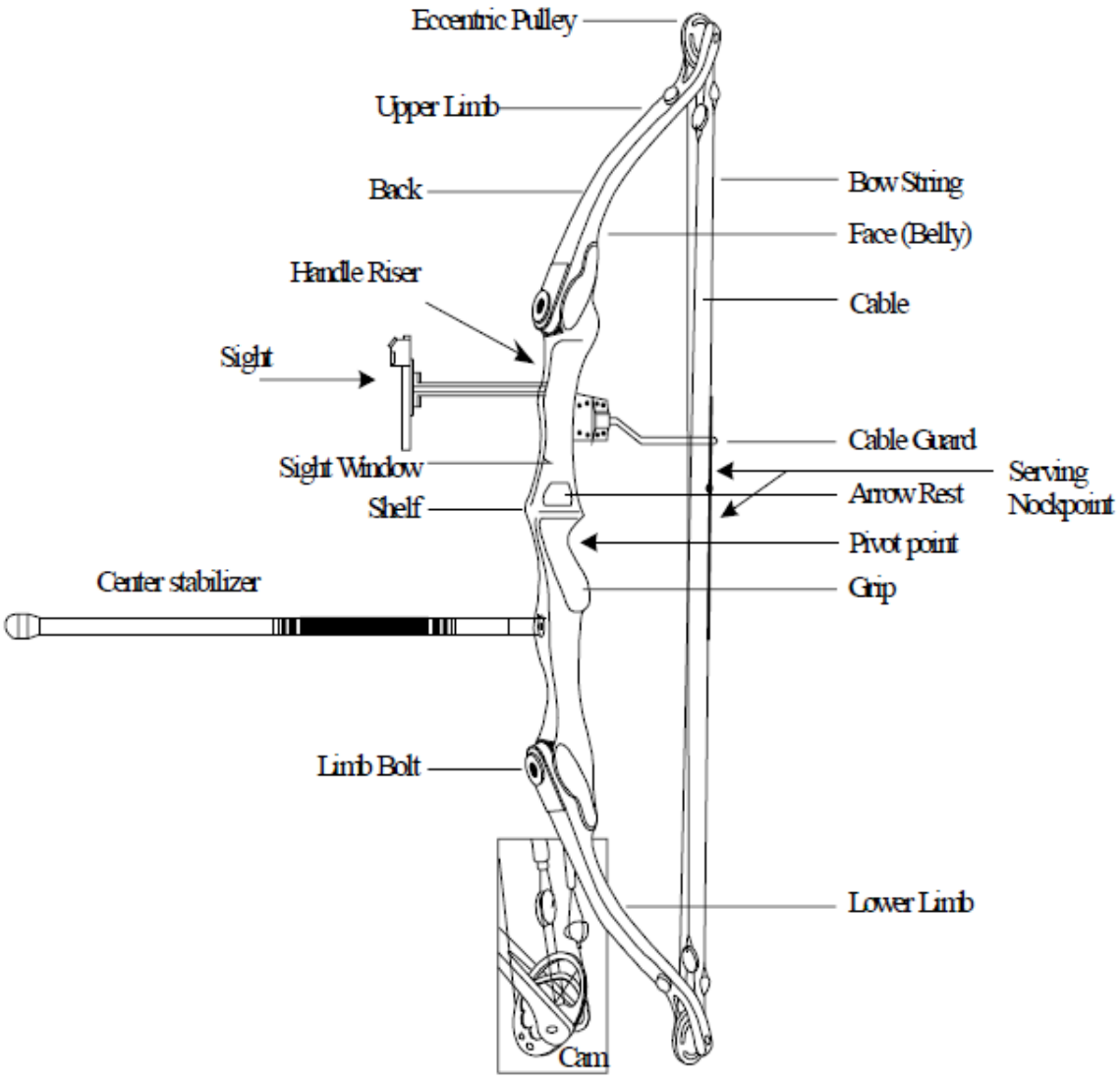


Figure 20: Compound Bow Terminology

18.1 Purpose of cam and pulley system

The cam and pulley system means allow compound archers to shoot at full draw, whilst only holding a fraction of the bow's peak draw weight. See Figure 21 below for an example between the

difference of a recurve and compound force draw curve. Whilst the recurve bow increases in poundage the more you pull it back, the compound bow increases quickly in poundage, before reducing in draw weight as the off-set cams roll over.

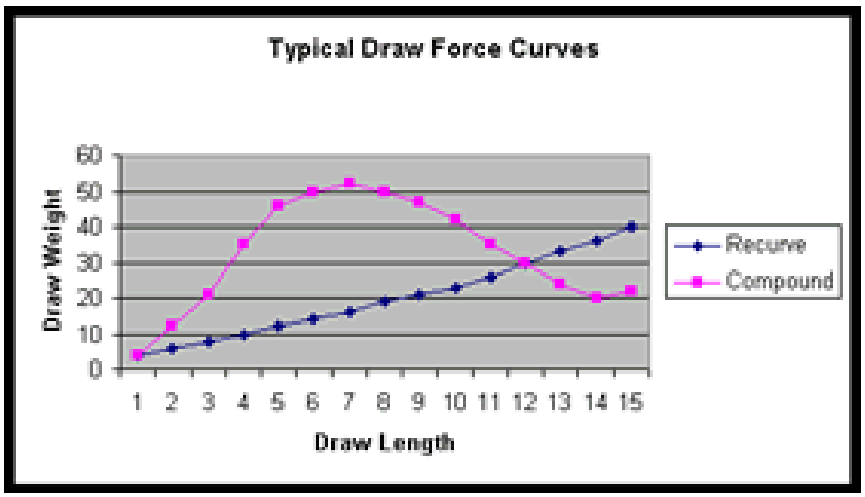


Figure 21: Recurve and Compound Force Draw Curve

For the compound, there is a valley (minimum holding weight) before the poundage increases further (hitting the wall). The compound bows are much faster than recurve bows and hence will enable those with short draw lengths or low poundages the ability to shoot and compete at longer distances. Many with back, shoulder or arm injuries will take advantage of using a compound as they can use much lower poundage to reach the same distance in competition.

Note that World Archery limits compound bows to 60# in competitions. With variability of bow scale weights, it is preferable that there is at least a pound or two contingency, so don't recommend that an archer sets their bow to 59.9#!

18.2 Compound draw length

With modern compounds, archers shoot 'against the wall', which means pulling the bow until it hits the stops. The equipment dictates that a compound bow can only be set up for one draw length at a time; hence it is important to tailor this draw length to the archer.

Most compounds will have the ability to increase or decrease draw length by rotating cam modules with Allen keys, or moving the draw stop pegs. Check the user manual if need be, but be sure to move both by the same amount. A few bows (especially high performance bows) will need a bow press to change draw length. In this case, if you do not have the correct type of bow press and experience, it is best to let a trained archery technician modify the draw length.

As a coach, you need to ensure that the archer has the correct draw length, however, regardless of whether you or someone else needs to change the draw length. The same principles as recurve apply – there should be a straight line from the tip of the elbow, through the D-loop on the string, to the pressure point of the hand on the bow.

18.3 Peep Height

Compound archers are entitled to use a peep sight, which is fitted between the strands of the string as per Figure 22 below. Archers should line up the scope in the centre of the peep, and this is useful

in aligning the bow with the target. The peep sight should always be secured with serving to prevent it coming loose upon firing.

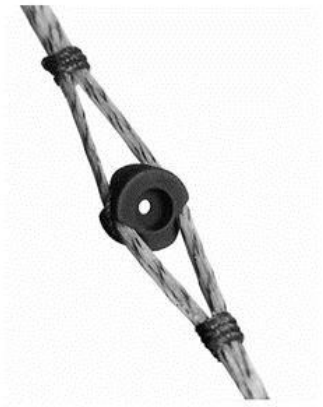


Figure 22: Peep Sight

Always set the correct draw length first, before you set peep height. To set the correct peep height, have the archer draw the bow with their eyes closed, and reference with the gap between their index and middle finger knuckles on their jaw line. When they open their eyes, they should see the sight through the peep. If not, it needs to be moved up or down.

If the peep sight does not rotate correctly, the archer will not be able to see through it. Some entry-level compounds use an elastic cord to pull the peep sight in line, though there are risks of this breaking in competition as there is a lot of force on these cords.

Without a cord, a bow press will be required to rotate strands around the peep. Note that the peep must always have an equal number of strands on either side of it to be centred. If the peep is slightly off line, this can be countered by rotating the D-loop on the string slightly, and tightening the D-loop. These items can be undertaken by a bow technician if the coach does not have the equipment.

18.4 Compound Arrow Rest

Because of the use of release aids, the arrow does not flex horizontally (as with a finger release), but rather vertically. Hence, a compound arrow rest, also known as a launcher, is required.

18.5 Release Aids

There are three main types of release aid, which act on the following mechanisms:

1. Lever (Trigger)
2. Rotation (Back-Tension)
3. Pressure (Poundage)

18.5.1 Trigger

The Trigger is the most common type of release aid, and works by the archer squeezing a lever which activates the shot after a certain pressure is applied. See Figure 23 below for an example of a trigger release aid. Note that some triggers can also be attached with a wrist strap.

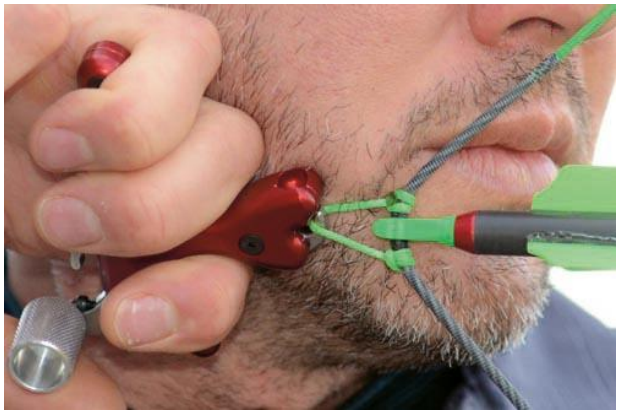


Figure 23: Trigger Release Aid

18.5.2 Rotation

Rotation release aids are commonly referred to as 'back-tension' releases, and operate by the rotation of the device until the activation point is reached.

Care must be taken with these types of release aids during the draw, as if over-rotated, they can release early, potentially causing the archer to 'punch' themselves in the mouth due to the force of the string being released. The bow must ALWAYS be drawn level, as if aimed high during the draw, a misfire can send the arrow very far behind the target.

There is usually a 'peg' for the archer to grip with their thumb during the draw – this helps prevent the release aid from rotating to the activation point during the draw. Likewise, this can be gripped when drawing down.

Figure 24: Rotation Release Aid

18.5.3 Pressure

Pressure release aids are less common (e.g. Carter Evolution). They are drawn back with a safety activated. When at full draw, the safety is released, and the bow drawn into the wall until the release aid activates at a certain poundage. These release devices are not recommended for beginners, as the mechanism means that the release aid needs the safety device reactivated before coming down for an emergency.

18.5.4 Proper Activation of a Release Aid

Regardless of the type of release aid, the method of activation is the same. The archer should take a deep grip in the release device, draw the bow in the direction of the target without sky-drawing, taking care that the release device cannot be activated (i.e. thumb folded away/off the trigger, or back-tension release aid under-rotated so that it will not fire during draw).

For all types of release aids, the archer should then take up a majority (>90%) of the pressure or rotation required for activation of the shot, then use back tension to gradually increase the pressure or rotation, to the point where the release aid activates itself.

A 'surprise release' is desirable, as this will eliminate anticipation of the shot.

19 Equipment Maintenance

19.1 String Wax

String wax can be applied (in small amounts only) to protect the string from the elements, and this helps to lubricate the strands, preventing wear and breakage of strands.

19.2 Thread Locker

Use thread locker to keep certain key threads in position for grub screws etc. Be careful to select the correct type of thread locker for the thread material.

19.3 Spares

Archers should keep spare equipment for what they are most likely to break. Recommend a number of spare arrows in case of lost fletches, broken nocks, etc. A spare string, finger tab and sling are very useful. Archers involved in tournament shooting should keep spares for a wider array of equipment.

19.4 Care for Equipment in the Rain

Ensure that archers dry their equipment thoroughly following a session of training in the rain. This will prevent corrosion of the equipment. Equipment should be left out of the case to enable it to dry thoroughly.

20 Mental Training

20.1 Shot Process

The purpose of a shot process (shot routine) is to gain focus and physical consistency through mental consistency, i.e. to shoot the same; you must think the same on every single shot.

The coach can develop an athlete's shot process that focuses the mind, and embeds certain changes that an archer is working on at the time. Hence, a shot process can change and develop over time, so coaches should work with their archers to keep it 'live', and relevant.

Pick a few key words that the archer should think about through their shot cycle. For example, if you are trying to embed a consistent set-up and expansion of the shot, you might choose:

1. Hand (Placing hand correctly in the bow grip)
2. String (Places fingers on the string, just behind the first finger joint)
3. Low (Sets the front shoulder low during the 'set' phase of the shot)
4. Grow (Smooth expansion through the clicker zone)

One benefit of a shot process is that it keeps the mind focused on the task at hand. During tournament conditions, an empty mind is easy to distract. If you have an active thought process in your mind, archers will be less likely to succumb to distractions.

Start with only 3 or 4 key words, but for more advanced archers, you can add more words, as long they only think about one at a time, in sequence. The words should be one syllable if possible for brevity. After a lot of practice, just thinking the key word (or the coach mentioning it) will impart the desired feeling, and can be useful for effective coaching in tournament situations.

20.2 Goal Setting

Goal setting is an important process for athletes at all level. Without goals, archers can lack direction and focus, and will be less likely to achieve their potential. It is a coach's responsibility to assist the archer in developing and attaining their goals.

Goals should follow the 'SMART' rule:

Specific (e.g. specifying a tournament goal, rather than "I want to improve")

Measurable (so that you can assess your progress)

Achievable (ensure that it is realistic)

Relevant (is a suitable stepping stone for their long-term 'pinnacle' goal)

Timely (again, to ensure that they will progress to their key goals in a suitable timeframe)

The coach should assist the archer in understanding what progression is realistic for their level of performance. Score-based goals are often easy to work into the SMART goal-setting system, but be aware that too much of a focus on score can create a mental barrier. It is ok to work some non-SMART goals in also. Usually a focus on improving the technique and process will have the result of an improved score anyway.

All goals should be regularly reassessed to ensure they remain relevant, in line with the archer's progress.

20.3 Relaxation

Attending your first tournament can seem daunting at first, but it does not need to be. If a student is under stress, get them to breathe slowly, deeply (diaphragmatic breathing), and relax their muscles. Then advise them to focus solely on their shot process, not to any distractions that may come around.

A conscious effort in relaxing the shoulders, neck muscles, right the way to the fingertips, can help to lower stress. Imagery of a relaxing scene or meditation will help also, but needs to be trialled in practice first to be effective.

It is also useful to give your students some perspective when they are stressed – remember that it's just a sport!

21 Technique

21.1 Anatomy

21.1.1 Back Tension

'Back Tension' is a concept used by coaches to explain the process for correct muscle use at full draw. Activating back tension involves squeezing the string arm shoulder blade (scapula) towards the spine. This is balanced by extending the bow arm towards the target. Think of it as a balanced push/pull action.

A good way to get an archer to understand the muscles involved is to hold up their string forearm up, parallel to the shoulders and hand about 20cm in front of their chin. Then, get them to keep the forearm parallel to their shoulders, but bring the forearm towards them, so that their hand ends up touching their chin. They should feel muscles in their back pulling the shoulder blade in towards the spine. With good body awareness, they will be able to use these muscles at full draw to expand through the clicker region.

Note that for back tension to work effectively, the string arm shoulder blade should not be hard up against the spine - there should be some room to expand slightly throughout the follow-through.

21.1.2 Body Geometry

Not everyone has the same body geometry or flexibility, so it is not always possible to attain the 'ideal' techniques. For instance, some archers will have a range of sizes of nose and chin, generating some difficulty in touching string to both the nose and chin. For archers with small noses, it may be useful to affix a 'kisser button' to the string that they can locate against their lips. Another option may be for the string to remain on the tip of the nose, and for the reference on the chin to come further around the side of the chin.

21.2 Biomechanics

21.2.1 Stance

The stance provides the base stability of a shot, like a good tripod for a sniper rifle. If your stance is not stable, the archer will not be able to build a solid shooting platform, especially in windy conditions.

As per the '9 Steps' diagrams, the three foot stance positions are open, square and closed. While a square stance (as per Figure 25 below) is easiest to understand for beginners, more experienced archers will generally shoot with an open stance, with their front foot moving to the left of the target for a right-handed archer (and vice-versa for left-handed). This increases core stability by pre-tensing the abdominal muscles, improving the archers' resistance to wind.

The stance should be approximately shoulder width apart. A wider stance will give more stability in the wind, but take a lot more energy in the legs to maintain, and tire an archer out faster.

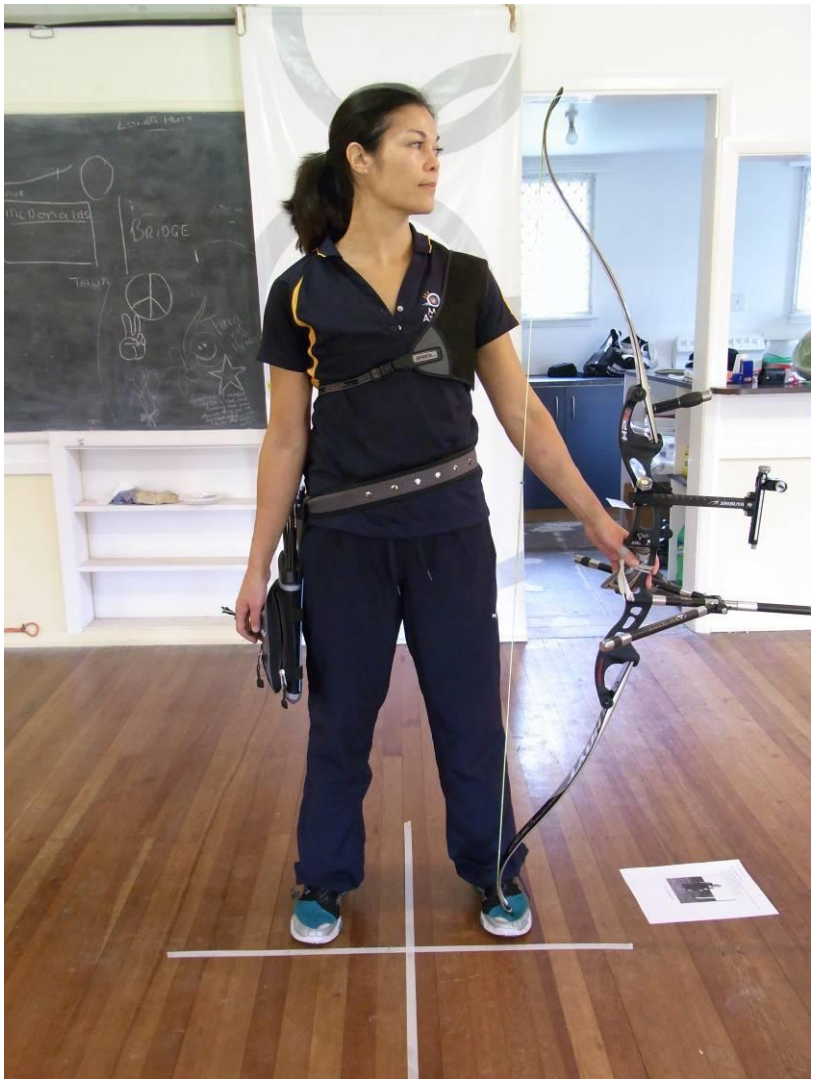


Figure 25: Square Stance

21.2.2 Posture

An archer's posture is generally determined by the position of their hips and the alignment of their spine. With feet alignment pointing to the left, and good shoulder alignment pointing to the right (for right handed archers), the hips should be left to rest mid-way between the two. The spine should be straight (albeit allowing for the 'natural' curve), but without a hollow back.

An archer should not lean away from the target, but should stand vertical.

21.2.3 Bow Hand

The bow hand should be comfortably positioned at the top of the bow grip, with the pressure point on the ball of the thumb, and the wrist relaxed as indicated in Figure 26 below.

Figure 26: Correct Bow Hand Position

Observe how the knuckles are at 45 degrees from the vertical, and the pressure is on the thumb muscle, rather than the palm of the hand. If the palm of the hand comes into contact with the grip, it will torque the bow (a force that rotates the bow upon release).

Note that if the wrist is not properly positioned, it will be impossible to relax it at full draw. From above, the end of the radius bone (at the base of the thumb), should be positioned in line with the centre of the riser.

21.2.4 String Grip

The string grip should be set up before the pre-draw phase, and remain consistent and relaxed throughout the draw. Due to the difference in finger lengths, the middle finger will have a deeper hook than the index and ring fingers. It is recommended that the middle finger has the pressure just behind the first groove, and the index and ring fingers have the pressure just in front of the first groove.

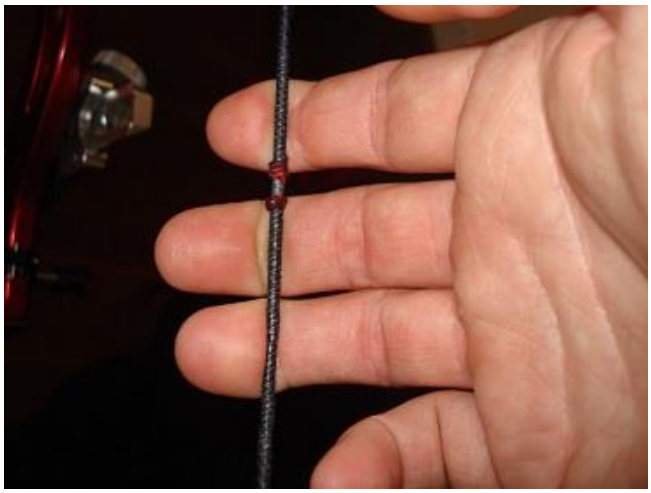


Figure 27: Location of String on Fingers

If the string is on the tips of the fingers, there will be too much tension in the fingers to release cleanly. Conversely, if too deep a 'hook', the release will be less clean due to the added mass of fingers that it needs to push out of the way. Note that shorter bows will have a more acute angle on the fingers.

21.2.5 Shoulder Position/Alignment

Like the stance, there are a range of shoulder positions that are classified as:

- Open – shoulders pointing left of the target for a RH archer
- Square – shoulders in line with the target
- Closed – shoulders pointing right of the target for a RH archer (shoulders in line with bow arm)

It is preferable that the shoulder position be closed, so that the shoulder joints form a straight line with the bow arm (D-E in line with C-D in Figure 28: Shoulder Alignment below). While square is acceptable (where archers do not have sufficient clearance for a closed position), the more open the shoulder position is, the more muscles the archer must use to keep the front arm collapsing.

For both shoulders, a low position must be maintained. The lower the front shoulder position, the less force will be required to keep the bow arm up and the more consistent the draw length. The lower the back shoulder and shoulder blade, the easier it will be for archers to get their string forearm in line with the line of force.

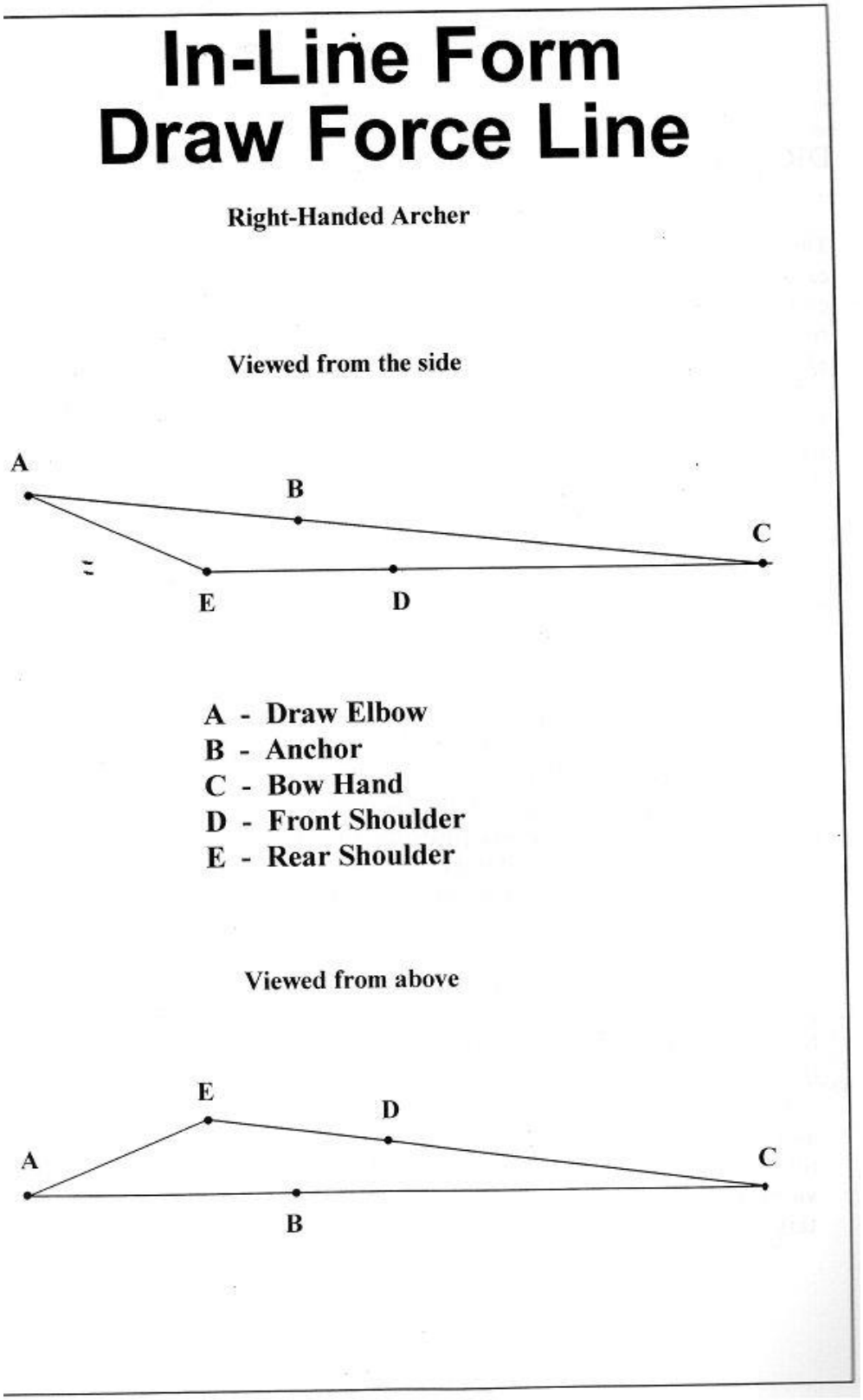


Figure 28: Shoulder Alignment

21.2.6 Alignment

One of the more important things for archers to do is to get their string forearm in line with the pressure point on the bow (A-B in line with B-C on Figure 28 above). This will have the string elbow slightly above parallel with the ground.

21.2.7 String Hand/Wrist

Releasing well is achieved by only relaxing muscles in the fingers/wrist, and continuing to use every other muscle with the same force before, during and after the shot. It can be difficult to relax muscles instantaneously when the wrist is highly tensed.

Note that the wrist will only be able to be relaxed if the archer has their string forearm aligned with the pressure point in the bow.

21.2.8 Head Position

The head position should be upright (eye line horizontal), rotated towards the target, and the neck reasonably relaxed. Wearing glasses will necessitate the head being turned more towards the target.

21.2.9 Analysing Biomechanical Issues

In analysing technique issues, it is important for the coach to focus on the root cause, not the symptoms. For example, an archer's release hand may flick away from their face on release. Rather than telling them to relax their wrist, you should be aware that they will need to have their forearm aligned with the line-of-force before they will be able to relax their wrist.

21.3 Using a Clicker

21.3.1 Purpose of a Clicker

The purpose of the clicker is a draw check device to ensure that a recurve archer draws the bow to the same distance (and poundage) every shot. While use of a clicker is not mandatory, when used well it can significantly improve a recurve archer's accuracy. See Figure 29 below for an example.

Figure 29: Clicker

21.3.2 Setting the Correct Draw Length

The clicker is set correctly when it activates with the following conditions being met:

- Posture is correct
- Shoulder alignment is correct
- Head position is correct
- The archer is at full draw (string at correct face references), with the string forearm in line with the line of force
- Front wrist is in correct position (i.e. not extended as a 'high' grip)

For an established senior archer, the clicker position should be near the back of the riser. Any further and there will be more drag on the arrow than necessary.

For a junior archer who is growing, it is important to set the clicker an inch or two past the back of the riser, so that as they grow, they will not over-draw the rest. Some models of clickers can have a lot of flexibility of settings, i.e. a magnetic clicker with a steel rod that can be bent. It is important to check the clicker position of growing archers every month or two to ensure that their draw length increases in line with their growth.

Ensure that the clicker is not so stiff that the cushion plunger depresses with the pressure of the clicker. The clicker length should cover the entire diameter of the point.

21.3.3 Proper Use of a Clicker

To use a clicker well, the archer should come from the pre-draw position to the reference point, and have only a few millimetres left. The archer then expands through the shot using back tension, until the clicker goes off. The archer will need to allow enough room for expansion in their back – if they have their shoulder blade locked against their spine, they have no ability to expand further!

Once the clicker goes off, the archer should instantaneously relax their string fingers and wrist, but continue to expand with the back muscles. If an archer's hand comes forwards at any point during the release, they are relaxing their back tension when the clicker goes off.

It is important that when the clicker goes off, the archer releases the arrow subconsciously and immediately. If the archer is not trained to automatically release the arrow, then there will be uncertainty in their head as to whether or not to release, and this can create conflicting messages from the brain to the muscles, and a lot of tension in the shot. Likewise, even if the archer is not pointed in the middle when they release, they should not try and move the aim before releasing – this will destabilise the shot. Executing a bad shot aimed in the middle will generally provide fewer points than a good shot aimed further from the middle.

21.3.4 When to Start Using a Clicker

This course recommends that once archers have developed reasonably consistent posture and shoulder alignment, a clicker can be introduced (and will even assist in improving consistency of these). It can be introduced as early as immediately following a beginner course, but it is very important that the archers be coached in how to use the clicker well from the first time they use one – it is easy to set in place bad habits that take a long time to eliminate.

22 Problem Correction – Practical

In this section, the candidates will analyse the technique of a number of archers, and advise how they would improve the archers' performance.

The Instructor should have prepared for some archers to be available for the candidates to analyse. If this is not possible, then candidates may analyse video footage of archers.

Candidates should note that they will not be giving feedback to the archers directly. They should silently and individually observe the archers for a number of ends, and from a number of different angles to make their assessments. They should then report back to the Instructor, noting the following:

- Key opportunities for improvement
- Action plan to undertake the changes required

If required, the candidates may ask the archers some very basis questions, including what their poundage is, how long they have been shooting for, and what their goals are.

The Instructor will give feedback on whether they have identified the key opportunities for improvements, and also on their proposed methodology for implementing changes.

23 Physical Preparation

23.1 Preparation for Shooting

Warm up and cool down exercises are essential for mobility and recovery. They only need to last a few minutes, but will help to reduce the incidence and severity of injury.

Stretches will help to further increase mobility and reduce the risk of injury. Recommended stretches will focus on the back, shoulders, arms, neck and wrists. Elastic bands can be used to warm up and stretch also, as per the following diagrams.

Below are some stretches that could be done if no stretchy band is available:

Trunk side flexors

1. Stand with your feet comfortably apart.
2. Fold your arms above your head.
3. Bend to the side slowly.
4. Stretch up, with your upper elbow.

Pectorals

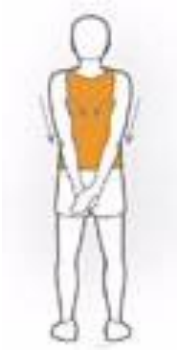
1. Stand side-on to a wall.
2. Move the leg closest to the wall forward.
3. Place your forearm on the wall with your shoulder slightly above 90°.
4. Turn your upper body away from wall.

Triceps stretch

1. Place your hand between shoulder blades.
2. Place your opposite hand on your elbow.
3. Pull your elbow towards your midline, with help from opposite hand.

Shoulder/Chest

1. Stand with your head up, chin in, hands clasped behind your back.
2. Pull your shoulders down and back.
3. Press your shoulder blades together and down.
4. Pull your stomach in, to prevent arching of the lower back.



23.2 Exercise Plan

Cardiovascular fitness and strength can improve an archer's performance.

Coaches should be able to tailor a fitness programme, including activities such as walking, running (on grass!), cycling, swimming activities, which will increase the cardiovascular fitness of the archer. Stretchy band exercises can be incorporated.

If an archery-oriented weights programme is required for strength or endurance, consult a personal trainer. Weights programmes should generally be avoided for children until they are over the age of 16, and even then, caution is advised.

24 Drug-Free Sport

For archers looking to compete in tournaments, there are strict controls around use of performance-enhancing substances. Important information can be found on the NZ Drug-Free Sport website, and World Anti-Doping Agency:

http://www.drugfreesport.org.nz/

http://www.wada-ama.org/

There is a number on the NZ Drug-Free Sport website that athletes can call or text to anonymously request information about whether a substance is banned or not. It is important that the athletes know whether substances they are using are banned or not. Pharmacists and Doctors have access to a list of banned substances in sport, be sure to let your doctor know that you participate in competitive archery, and may not utilise banned substances.

24.1 Common Banned Substances

Some common substance groups which are banned are (but not limited to):

- Cannabinoids
- Steroids
- Beta-Blockers
- Opiates
- Some cold and flu medications (Pseudoephedrine)
- Alcohol – limit is far lower than the NZ drink-drive limit (essentially nothing)

Many banned substances are also found in herbal remedies – archers should not take these unless they can be certain that ALL ingredients are allowed.

Please note that the banned drug list changes annually, and should be reviewed for updates.

24.2 Penalties for drug use

All athletes can be tested in-competition. Some elite athletes will also be on an out-of-competition drug testing register, meaning that drug-testing staff may turn up to their house unannounced in order to perform a drug-test. A refusal to undertake a drug test counts as a positive drug test.

Penalties can vary depending on the class of a drug, but will usually involve an exclusion from all sport competitions for a period of years.

24.3 Therapeutic Use Exemptions

Some athletes will require the use of banned substances when they are no alternative medicines available for critical health conditions. In this instance, athletes will need to apply for a Therapeutic Use Exemption (TUE) as per requirements found on the NZ Drug-Free Sport website.

25 Appendices

25.1 References

American NAA Coaching Manuals

World Archery Level 1 Coaches Manual

ACC Static Stretching Website

25.2 '9 Steps to the 10 Ring' Posters